The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 123, No. 11 — CHICAGO, ILLINOIS — NOVEMBER 13, 1943

COPYRIGHT, 1943, BY AMERICAN MEDICAL ASSOCIATION

SULFONAMIDES IN BRONCHIAL SECRETION

THE EFFECT OF SULFONAMIDES IN BRONCHIECTASIS

CHARLES M. NORRIS, M.D.
PHILADELPHIA

The frequency of chronic infectious diseases of the bronchi and the limitations of the various medical measures used in their treatment would appear to justify an investigation of the possibilities of sulfonamide therapy, yet a review of the recent literature shows only a few brief references to this subject. Although the pathologic changes in many of these diseases are at least partially irreversible, it would seem logical that diminution in the infectional factor should result in improvement. Acquired bronchiectasis and chronic asthmatoid bronchitis are characterized in their earlier phases by impairment in the function of the bronchi and bronchioles; gross structural disease is in most cases a secondary development. The possibility of restoring normal structure and function by medical measures is not a likely one, but partial elimination of infection would be expected to have a favorable effect on the symptoms and on the natural course of the disease.

The distribution of the sulfonamides, including sulfadiazine,[1] among the various body fluids has been thoroughly studied. The purpose of the first part of our investigation was to determine (1) the correlation between blood levels of sulfonamide following oral administration and their concentration in bronchial secretion and (2) the concentration in bronchial secretion resulting from the intratracheal or intrabronchial instillation of sulfonamide at twenty-four hour intervals following the instillation.

Because the character of bronchial secretion presents a special problem in chemical analysis, a modification of the Bratton and Marshall [2] method for the quantitative determination of sulfonamide concentration, applicable to bronchial secretion, was devised.[3] Because of the obvious inaccuracies which would result from the use of sputum for such analyses, only bronchoscopic specimens were submitted to examination. The use of cocaine hydrochloride as a local anesthetic preliminary to bronchoscopy does not interfere with the color reaction on which the determination is based. Atropine was omitted from the usual prebronchoscopic hypodermic because of its drying effect on the bronchial secretion.

From the Chevalier Jackson Bronchoscopic Clinic, Temple University Hospital.

1. Reinhold, J. G.; Flippin, H. F.; Schwartz, Leon, and Domm, A. H.: The Absorption, Distribution and Excretion of 2-Sulfanilamido Pyrimidine (Sulfapyrimidine, Sulfadiazine) in Man, Am. J. M. Sc. **201**: 106-115 (Jan.) 1941.

2. Bratton, A. C., and Marshall, E. K., Jr.: A New Coupling Component for Sulfanilamide Determination, J. Biol. Chem. **128**: 537-550 (May) 1939.

3. The author is indebted to Robert H. Hamilton, Ph.D., M.D., associate professor of physiological chemistry, Temple University School of Medicine, for this modification, which he developed, and for the description of technic.

DETERMINATION OF SULFONAMIDE IN BRONCHIAL SECRETION; A METHOD FOR OBTAINING A CLEAR FILTRATE [3]

Solutions used, except 10 per cent sodium hydroxide, are those of Bratton and Marshall. Transfer secretion to beaker, obtaining weight by difference. Add gradually 10 per cent sodium hydroxide enough to render the secretion homogeneous (not more than an equal volume). Rinse solution into a stoppered graduate with saponin solution, diluting until viscosity appears low. Add 15 per cent trichloroacetic acid solution, a small amount at a time with gentle shaking, until the point is reached at which a little of the precipitate remains undissolved after prolonged shaking. Note volume. Divide latter by weight of sample of secretion to obtain dilution. Remove to a small flask the number of cubic centimeters corresponding to 1 Gm. of secretion and add enough saponin solution to bring the volume to 16 cc. Add 4 cc. of 15 per cent trichloroacetic acid solution, shake well, filter, and proceed with the clear filtrate as with a blood filtrate.

RELATION BETWEEN CONCENTRATIONS OF SULFONAMIDE IN BRONCHIAL SECRETION AND IN BLOOD AFTER ORAL ADMINISTRATION

The amount of secretion present in the bronchial tree of normal subjects is insufficient to permit collection of adequate amounts for chemical analysis. Therefore, as subjects for this investigation, 12 patients with acquired bronchiectasis under treatment at the Chevalier Jackson Bronchoscopic Clinic were chosen, an effort being made to select those with varying degrees of disease and to include patients who produced but small amounts of sputum as well as those with much expectoration. The bronchiectasis was of the saccular type in 8 cases and of the cylindric or fusiform type in 4.

Sulfadiazine was given by mouth in sufficient dosage to maintain adequate blood levels. Specimens of bronchial secretion were obtained by bronchoscopy at intervals of from one to four days and the concentration of sulfadiazine determined by the method described. The results were then compared with the concentrations in specimens of blood taken at the time of bronchoscopy.

Results.—The results of the individual determinations are shown in table 1. The concentrations of sulfadiazine in bronchial secretion range from 1.8 to 11.6 mg. per hundred grams, with corresponding blood sulfadiazine levels of from 3.9 mg. to 16.4 mg. per hundred cubic centimeters.

The average ratio between the two concentrations (bronchial/blood) was 0.58, with an average variation from the mean of 0.08, or 14.0 per cent. The ratio obtained in considering only those determinations with the higher results (blood levels from 10.0 to 16.4 mg. per hundred cubic centimeters) is only slightly higher (0.61) than that obtained by considering only the determinations with the lower results (0.55). The values obtained in those patients who produced but little bronchial secretion differed to no significant degree from those in the patients who produced large amounts; furthermore the ratios obtained in the cases of saccular bronchiectasis do not differ appreciably from those

TABLE 1.—*Relation Between Concentrations of Sulfadiazine in Bronchial Secretion and in Blood Following Oral Administration*

		Approximate Daily Sputum Volume	Sulfadiazine Concentration (Mg. per 100 Cc.)		Ratio Bronchial / Blood	
			Bronchial Secretion	Blood		
S. J.	Bilateral cylindric bronchiectasis	25 cc.	4.8	7.2	0.58	
			7.5	12.3	0.61	
			7.5	10.2	0.73	
			6.0	11.2	0.54	Av. 0.62
F. S.	Bilateral cylindric bronchiectasis	40 cc.	5.0	13.0	0.39	
			6.2	10.5	0.59	
			11.6	16.4	0.70	Av. 0.56
H. F.	Unilateral cylindric bronchiectasis	15 cc.	2.2	7.0	0.32	
			4.0	8.5	0.47	Av. 0.40
E. M.	Bilateral cylindric bronchiectasis	5 cc.	8.2	13.8	0.59	
			6.0	9.5	0.63	
			2.0	7.2	0.28	
			7.8	10.4	0.75	Av. 0.56
V. R.	Bilateral saccular bronchiectasis	200 cc.	7.5	12.0	0.62	
			4.6	9.5	0.48	Av. 0.55
B. B.	Bilateral saccular bronchiectasis	60 cc.	5.2	7.5	0.69	
			9.5	12.0	0.79	
			2.0	5.4	0.37	
			4.5	7.2	0.63	Av. 0.62
M. S.	Bilateral saccular bronchiectasis	400 cc.	3.8	8.0	0.48	
			2.2	3.9	0.56	
			3.8	12.8	0.30	Av. 0.45
D. B.	Bilateral saccular bronchiectasis	50 cc.	4.5	9.0	0.50	
			8.0	8.5	0.94	
			6.8	7.6	0.89	
			3.3	5.4	0.61	
			9.4	12.7	0.74	
			8.0	10.0	0.80	
			8.0	11.8	0.68	Av. 0.74
E. C.	Unilateral saccular bronchiectasis	30 cc.	3.5	9.6	0.37	
			3.3	10.2	0.32	
			5.9	10.4	0.57	Av. 0.42
J. T.	Bilateral saccular bronchiectasis	.....	3.2	6.0	0.53	
			6.2	8.1	0.76	
			3.8	9.5	0.40	Av. 0.56

obtained in the cases of fusiform and cylindric bronchiectasis, the averages being 0.59 and 0.55 respectively.

SULFONAMIDE CONCENTRATION IN BRONCHIAL SECRETION FOLLOWING INTRATRACHEAL OR INTRABRONCHIAL INSTILLATION

The feasibility of using solutions showing bactericidal or bacteriostatic activity for intrabronchial instillation or lavage has been demonstrated by Kolmer,[4] Stitt,[5] Moore [6] and others. As subjects for this investigation, 10 patients having acquired bronchiectasis were used. In all, eighteen instillations were performed, a 5 per cent suspension of microcrystalline sulfathiazole [7] being used in 12 instances and a 2.5 per cent aqueous solution of sulfadiazine [8] in 6. Several of the instillations were performed bronchoscopically; the remainder were performed by instillation through the larynx following preliminary cocainization. Specimens of bronchial

TABLE 2.—*Concentration of Sulfonamide in Bronchial Secretion Following Intratracheal or Intrabronchial Instillation*

	Approximate Daily Sputum Volume	Instillation	Concentration (Mg. per 100 Cc.)	
			24 Hours	48 Hours
E. M.	5 cc.	Sulfathiazole, 1.0 Gm.	170.0	3.5
D. W.	10 cc.	Sulfathiazole, 1.0 Gm.	98.0	Negative
S. J.	25 cc.	Sulfathiazole, 0.5 Gm.	22.0	Negative
J. T.	30 cc.	Sulfathiazole, 1.0 Gm.	4.6	Negative
		Sulfathiazole, 1.0 Gm.	6.0	Negative
D. B.	50 cc.	Sulfathiazole, 1.0 Gm.	9.0	Negative
		Sulfathiazole, 1.0 Gm.	9.2	5.7
		Sulfathiazole, 0.6 Gm.	Negative	
V. R.	200 cc.	Sulfathiazole, 1.0 Gm.	60.0	
		Sulfathiazole, 0.5 Gm.	2.0	Negative
M. S.	400 cc.	Sulfathiazole, 0.5 Gm.	3.2	Negative
		Sulfathiazole, 1.0 Gm.	2.0	Negative
		Sulfadiazine, 0.5 Gm.	Negative	
E. F.	200 cc.	Sulfadiazine, 0.5 Gm.	Negative	
A. P.	100 cc.	Sulfadiazine, 0.75 Gm.	Negative	
		Sulfadiazine, 0.75 Gm.	Negative	
B. B.	60 cc.	Sulfadiazine, 0.75 Gm.	Negative	
F. C.	50 cc.	Sulfadiazine, 0.50 Gm.	Negative	

secretion were obtained by bronchoscopic aspiration at twenty-four hour intervals and the concentration of sulfonamide determined by the aforementioned method.

Results.—The results are given in table 2. The values obtained following instillation of microcrystalline sulfathiazole suspension appeared to depend largely on the amount of sputum being produced at the time of the instillation. The 2 cases in which unusually large concentrations were found at the end of twenty-four hours were those in which the average daily sputum volume had been 10 cc. or less; much smaller concentrations were found in the remaining cases. In 2

TABLE 3.—*Effect of Sulfonamide Therapy on Bacterial Flora in Ten Cases of Bronchiectasis*

	Sulfadiazine Orally		Sulfathiazole Instillation	
	Present Before Treatment in	Disappeared from Culture in	Present Before Treatment in	Disappeared from Culture in
Streptococcus hemolyticus				
Probably group A	3	1	2	0
Other groups	4	1	4	2
Streptococcus nonhemolyticus	7	4	5	1
Staphylococcus albus (nonhemolytic)	0	0	2	2
Pneumococcus, type 14	1	1	0	0
Pneumococcus, type 22	1	1	1	0
Pneumococcus, type 27	1	0	0	0
Pneumococcus, type 29	1	1	0	0
Hemophilus influenzae	2	0	2	1
Friedländer's bacillus	0	0	1	1
Bacteroides melaninogenicus	0	0	1	1
Other bacteroids	6	3	3	3
Neisseria flava	5	4	1	0
Neisseria sicca	4	4	0	0
Neisseria catarrhalis	5	2	2	1
Diphtheroids	1	0	1	1
Micrococci	2	2	1	1
Bacillus coli	1	0	0	0

instances appreciable amounts of sulfathiazole were found at the end of forty-eight hours.

In none of the cases following instillation of sulfadiazine solution were there significant amounts of sulfadiazine at the end of twenty-four hours, regardless

4. Kolmer, J. A.: Bronchial Disinfection and Immunization: Effect in Rabbits of Intrabronchial Injections of Various Chemical Disinfectants, Arch. Int. Med. **51**: 346-366 (March) 1933.

5. Stitt, H. L.: Bronchial Lavage for Disinfection and Immunization of the Bronchial Tree, J. Med. **14**: 576-579 (Jan.) 1934.

6. Moore, W. F.: Bronchiectasis and Pulmonary Abscess, S. Clin. North America **4**: 87-96 (Feb.) 1924.

7. Microcrystalline sulfathiazole 5.0 Gm., strong solution of iodine (Lugol's solution) 2.0 cc., distilled water to 100.0 cc.

8. Sulfadiazine powder 2.5 Gm., triethanolamine 7.5 cc., butyl parahydroxybenzoate 0.05 Gm., boiled distilled water to 100.0 cc.

of the amount of sputum being produced at the time of instillation. Presumably this is because the sulfadiazine, being in aqueous solution, is more rapidly eliminated by absorption and expectoration than the suspension of microcrystalline sulfathiazole.

EFFECT OF SULFADIAZINE GIVEN ORALLY IN ACQUIRED BRONCHIECTASIS

The 10 patients used as subjects for this investigation were given sulfadiazine by mouth in courses lasting from four to fifteen days. As an adjuvant measure to improve bronchial drainage, bronchoscopic aspiration was performed at intervals of from two to four days during the time the sulfadiazine was being administered. Bronchoscopic specimens were obtained for bacteriologic study at the beginning and end of each course, several reasons.[9] In the first place, spontaneous alterations in bronchiectatic flora are presumably rather frequent, so that the disappearance of an organism from the culture during the period of treatment does not necessarily mean that it has been eliminated by the specific therapy. Careful examination of table 4 will show several instances in which organisms not present before treatment were recovered in the bronchial secretion after treatment; in most cases these organisms were of the group ordinarily considered to constitute the normal throat flora, and their appearance in and disappearance from the bronchial cultures is therefore probably of no great significance.

The relative pathogenicity of the various organisms present in a given case is difficult to estimate except in a general way. Ordinarily, hemolytic streptococci

TABLE 4.—*Effect of Sulfadiazine Given Orally (Combined with Bronchoscopic Aspiration) in Ten Cases of Bronchiectasis*

	Drug	Bronchoscopies	Sputum Volumes Average First 24	Sputum Volumes Average Last 24	Cultures (Bronchoscopic) Before	Cultures (Bronchoscopic) After
D. S.	Sulfadiazine, 6 days, oral	Two	20 cc.	8 cc.	Few hemolytic streptococci, probably group A Few nonhemolytic streptococci Few N. flava and N. catarrhalis	Occasional nonhemolytic streptococci Occasional N. flava
E. C.	Sulfadiazine, 9 days, oral	Three	70 cc.	30 cc.	Few hemolytic streptococci; moderate number of nonhemolytic streptococci Few N. sicca and N. flava	Occasional hemolytic streptococci Many nonhemolytic streptococci Few bacteroids
B. B.	Sulfadiazine, 10 days, oral	Two	105 cc.	30 cc.	Few bacteroids Moderate number of hemolytic streptococci; few nonhemolytic streptococci Moderate number of bacteroids; few diphtheroids N. flava, N. sicca and N. catarrhalis	Few hemolytic streptococci Moderate number of H. influenzae Few N. catarrhalis
W. D.	Sulfadiazine, 9 days, oral	Three	50 cc.	5 cc.	Many pneumococci, type 14 Few nonhemolytic streptococci Few bacteroids, N. sicca, N. flava and N. catarrhalis	Few nonhemolytic Staph. aureus Moderate number of H. influenzae
S. J.	Sulfadiazine, 6 days, oral	Four	12 cc.	5 cc.	Moderate number of pneumococci, type 32 Few nonhemolytic streptococci Few N. catarrhalis	Few nonhemolytic and hemolytic streptococci Few N. catarrhalis and sicca
E. M.	Sulfadiazine, 4 days, oral	Two	24 cc.	6 cc.	Many pneumococci, type 29 Moderate number of N. sicca Moderate number of N. flava	Few nonhemolytic streptococci Few H. influenzae Few micrococci and diphtheroids
D. W.	Sulfadiazine, 6 days, oral	Three	260 cc.	44 cc.	Many mucoid hemolytic streptococci Few nonhemolytic streptococci Moderate number of bacteroids	Occasional nonhemolytic streptococci Moderate number of coliform bacilli
M. S.	Sulfadiazine, 13 days, oral	Six	230 cc.	53 cc.	Many hemolytic streptococci, probably group A Few nonhemolytic streptococci Few H. influenzae Few bacteroids and micrococci Many mucoid hemolytic streptococci	Moderate number of hemolytic and nonhemolytic streptococci Few bacteroids and micrococci Many H. influenzae Few hemolytic and nonhemolytic streptococci
V. R.	Sulfadiazine, 9 days, oral	Three	220 cc.	50 cc.	Many H. influenzae Many B. coli, few bacteroids	Moderate number of H. influenzae Few B. coli and bacteroids, occasional micrococci
E. F.	Sulfadiazine, 11 days, oral	Five	285 cc.	128 cc.	Many hemolytic streptococci, probably group A Occasional pneumococcus, type 27 Occasional micrococci and N. catarrhalis	Many hemolytic streptococci Moderate number of pneumococci Few bacteroids and N. catarrhalis

and daily sputum volumes were recorded accurately. An attempt was made to maintain blood levels between 8 and 12 mg. per hundred cubic centimeters, and blood counts and urinalyses were obtained at suitable intervals.

An estimation of the clinical effect was based on (1) reduction in amount of expectoration, and (2) alteration in the bacterial flora of the bronchial secretion, as determined in specimens removed bronchoscopically.

Results.—The results are presented in table 4. The outstanding effect was a definite and rather pronounced decrease in the daily sputum volume. The actual reductions in volume varied from 55 to 81 per cent, with an average of 69 per cent, so that most of the patients at the end of the combined course of sulfadiazine therapy and bronchoscopic aspiration were producing from one fifth to one third of the original amounts of sputum.

The effect on bacterial flora is summarized in table 3. The proper evaluation of these data is difficult for of certain groups, viridans streptococci, pneumococci, Friedländer bacilli and the like, are considered to be pathogenic, although this cannot be proved with certainty without pathogenicity testing. The Neisseriae (flava, sicca and catarrhalis) and the various bacteroids, diphtheroids and micrococci are usually considered as secondary invaders, but this of course does not mean that they are innocuous or that they have no part in producing symptoms or tissue damage.

Table 3 also summarizes the alterations in bacterial content noted following from one to three instillations of a 5 per cent suspension of microcrystalline sulfathiazole, as shown by cultures obtained bronchoscopically before and from twenty-four to forty-eight hours after the last instillation. The difficulties encountered in evaluating these data are the same as those already described.

9. Suggestions concerning evaluation of the bacteriologic data were given by Earle H. Spaulding, A.B., Ph.D., associate in bacteriology, Temple University School of Medicine.

COMMENT

The clinical data presented are intended as only a preliminary report; further study and observation will be required to confirm our impression that the measures described are of actual value. The general effect of sulfonamide compounds appears favorable, particularly when combined with a series of bronchoscopic aspirations. We have tentatively preferred the oral method of administration because of comfort and convenience from the patient's standpoint and because its use presumably allows a much more diffuse, uniform and prolonged action than can be obtained by instillation or a series of instillations.

The disadvantages encountered in the use of instillation are the following: 1. It is difficult to distribute the instilled material uniformly among the various diseased segments, even when the instillation is performed bronchoscopically. 2. Prolonged action can be maintained only by daily instillation; in the case of sulfadiazine aqueous solution, even this would fail to maintain sufficient amounts for continuous local effect. 3. The consistency of bronchial secretion appears to be unfavorably affected by instillation of sulfonamides; this change is particularly true in the case of microcrystalline sulfathiazole suspension, which causes a rather definite increase in the viscosity of the secretion. 4. Local efficacy of sulfonamides is greatly diminished in presence of purulent material of the type produced in bronchiectasis, although presumably the addition of an oxidizing agent such as strong solution of iodine at least partially destroys the inhibitory effect [10] of the para-aminobenzoic acid present in purulent exudate.

Untoward reactions were not observed in this study, with one exception. One of the patients, a girl aged 17 years with bilateral saccular bronchiectasis, developed fever reaching 102 F. the day following an instillation of 5 per cent microcrystalline sulfathiazole suspension. The temperature subsided promptly following bronchoscopic aspiration, and since the findings were not suggestive of a lobar atelectasis we believe that this temporary effect was due to transient occlusion of one or more of the segmental branch bronchi by thick secretion.

We hesitate to advance absolute indications for the type of treatment described. However, it would appear to be of definite value as a preliminary to lobectomy or pneumonectomy for suppurative disease. Here reduction in the amount of suppurative exudate from the diseased lung lessens the possibility of aspiration into the good lung at the time of operation and partially eliminates the risk of postoperative atelectasis or pneumonitis. Diminution of infection should likewise decrease the likelihood of postoperative empyema.

Riggins,[11] Perry and King [12] and others have amply emphasized the problem created by the morbidity of patients with well established bronchiectasis who fall into the nonsurgical group. These patients, if untreated, follow the natural course of the disease through a series of acute infectious complications to chronic disability and, usually, early death. The persistence of symptoms and progression of disease in bronchiectasis are due in the main to chronic infection. It has appeared to us that this factor can be most directly attacked by combining a measure which improves bronchial drainage and prevents stagnation (bronchoscopic aspiration [13]) in a rather intensive course with specific antibacterial therapy. This means, in most cases, hospitalization for a period of from seven to ten days.

It is not possible to predict in advance which patients will obtain the most clinical benefit. For example, M. S., a girl aged 19 years with unusually extensive saccular bronchiectasis involving four lobes, had been producing approximately a pint of foul sputum daily. She was given a course of sulfadiazine by mouth for nine days and received four bronchoscopic aspirations during the same period. Her sputum was reduced to less than one fifth of its former volume, and although the cultures showed no qualitative change in the bacterial flora there was substantial decrease in the odor. More significant is the fact that during the six week period after leaving the hospital this patient increased her weight from 99 to 116 pounds (from 45 to 52.6 Kg.), more than she had ever weighed previously.

Undoubtedly the research programs now under way will produce specific antibacterial substances whose action will be more potent and toxicity less than that of the sulfonamides we have been using. Penicillin has already been found effective in acute phases of pulmonary suppuration in the three cases reported by Blake and Craige.[14] Castex, Capdehourat and Lavarello [15] and more recently Harris, Sommer and Chapple [16] have administered sulfonamides by inhalation. Further investigations similar to the one which has been attempted in this study will probably be warranted.

SUMMARY AND CONCLUSIONS

1. The concentration of sulfadiazine in bronchial secretion during oral administration is approximately 60 per cent of the blood level. This ratio is apparently not materially affected by the extent of bronchial disease or the amount of expectoration.

2. After intratracheal or intrabronchial instillation of 5 per cent aqueous suspension of microcrystalline sulfathiazole, significant concentrations persist in the bronchial secretion for twenty-four to forty-eight hours. The concentrations are larger, as would be expected, in cases in which there is but little expectoration.

Elimination of 2.5 per cent aqueous solution of sulfadiazine following intratracheal or intrabronchial instillation appears to be much more rapid, the amounts remaining at the end of twenty-four hours being negligible.

3. Combined sulfonamide and bronchoscopic treatment in 10 cases of acquired bronchiectasis resulted in a considerable reduction in daily sputum volume, with favorable alterations in the bacterial flora.

4. The plan of treatment described should prove of definite value as a preliminary to lobectomy or pneumonectomy for suppurative disease. It is probably worthy of trial in cases of well established nonsurgical bronchiectasis.

3401 North Broad Street.

10. Strauss, Elias; Lowell, F. C., and Finland, Maxwell: Inhibition of Sulfonamide Action by *p*-Aminobenzoic Acid, J. Clin. Investigation **20**: 189-197 (March) 1941.

11. Riggins, H. M.: Bronchiectasis: Morbidity and Mortality of Medically Treated Patients, Am. J. Surg. **54**: 50-67 (Oct.) 1941.

12. Perry, K. M. A., and King, D. S.: Bronchiectasis: A Study of Prognosis Based on Follow-Up of Four Hundred Patients, Am. Rev. Tuberc. **41**: 531-548 (May) 1940.

13. Jackson, Chevalier, and Jackson, Chevalier L.: Peroral Drainage, Natural and Therapeutic, with Especial Reference to "Tussive Squeeze," Am. J. M. Sc. **186**: 849-854 (Dec.) 1933. Jackson, Chevalier L.: Bronchoscopy in the Treatment of Pulmonary Disease, Tr. Am. Therap. Soc. (1930) **30**: 101-109, 1931. Jackson, Chevalier, and Jackson, Chevalier L.: The Bronchiectatic Septic Tank: Its Prophylaxis and Treatment, Am. Rev. Tuberc. **30**: 599-606 (Dec.) 1934.

14. Blake, F. G., and Craige, Branch, Jr.: Penicillin in Suppurative Disease of the Lungs, Yale J. Biol. & Med. **15**: 507-516 (Jan.) 1943.

15. Castex, M. R.; Capdehourat, E. L., and Lavarello, A.: Nebulized Neoprontosil (Sulfanilamide Derivative) as New Therapy of Bronchopulmonary Suppurations, Rev. Asoc. méd. argent. **55**: 85-89 (Feb. 15-28) 1941.

16. Harris, T. N.; Sommer, H. E., and Chapple, C. C.: Administration of Sulfonamide Microcrystals by Inhalation, Am. J. M. Sc. **205**: 1-6 (Jan.) 1943.

SOME COMPLICATIONS OF CAUDAL ANESTHESIA AND THEIR MANAGEMENT

THOMAS G. GREADY JR., M.D.
CHICAGO

Recently there has been comparatively widespread and in some instances indiscriminate use of continuous caudal anesthesia in obstetrics. To prevent serious accidents, some of the hazards and the methods of preventing and combating them should be reemphasized.

As more data are accumulated, one learns of complications which might have been prevented had the proper safeguards been taken. Some of the complications presented followed the single injection rather than the continuous administration of the anesthetic. However, the same principles apply to the two groups.

In a series of 121 cases of caudal anesthesia at the Chicago Lying-in Hospital there have been no deaths, either maternal or fetal. However, some interesting reactions have occurred, the most frequent being a drop in blood pressure. Our incidence of failures is 16 per cent.

SUBDURAL INJECTION

Most serious and dangerous of the complications is that of injecting the solution into the subarachnoid space, and it has only been recently that precautions other than simple aspiration have been taken to prevent this accident.

While no deaths have been reported due to this complication since the introduction of continuous caudal anesthesia, there have been serious accidents, and in 1920 Zweifel [1] reported a series of 4,200 single caudal injections with 10 deaths, 3 of which were attributed to the anesthesia, an incidence of 1 in 1,400. All 3 deaths occurred within a few minutes of respiratory failure, and in connection with 2 of them punctures in the dura were demonstrated at autopsy. The third was not investigated and was ascribed to acute procaine poisoning. About three years ago a similar accident was observed by Eastman.[2] In approximately the one hundredth case of single dose caudal anesthesia in the obstetric service at Johns Hopkins Hospital a death occurred due to injection of 45 cc. of 1 per cent procaine hydrochloride into the subarachnoid space although the usual precaution of aspiration was carried out. Chemical analysis of the spinal fluid post mortem showed a lethal concentration of procaine.

My associates and I have observed perforation of the dura once in our series of 110 cases. In this instance the needle was introduced into the caudal canal and on aspiration no spinal fluid was obtained. According to the routine advocated by Hingson and Edwards [3] and Gready and Hesseltine [4] a test dose of 8 cc. of a 1.5 per cent solution of metycaine hydrochloride (120 mg.) was injected and ten minutes allowed to elapse. (The importance of this simple precaution cannot be too strongly emphasized.) At the end of ten minutes the patient had almost complete paralysis of the dependent extremity but was still able to move the toes on the opposite foot. In another two minutes there was complete motor paralysis of both lower extremities, while on the abdomen the anesthesia had risen to the level of the third thoracic segment. Since no spinal fluid was obtained by aspiration, it is apparent that had the precautionary measure of waiting ten minutes before injecting the 30 cc. dose not been taken the procedure would have resulted in massive spinal anesthesia (approximately 450 mg. in 30 cc.), which probably would have been fatal.

Block and Rochberg [5] report 1 case out of a series of 39 in which massive spinal anesthesia occurred. In their case 30 cc. of a 1 per cent solution of procaine hydrochloride had been given. Fortunately the patient survived after a prolonged period of artificial respiration.

Small [6] reported a similar case of possible massive subdural injection in spite of careful precautionary measures. He employed the continuous drip technic. Respiratory failure also developed.

Another such case has been brought to my attention by Brown.[7] In this instance a single caudal injection had been made for a proposed cesarean section. The patient survived spinal anesthesia high enough to cause both respiratory and vocal paralysis. These near catastrophic results illustrate the importance of combining preliminary aspiration with a suitable test for subarachnoid injection. Hingson and Edwards [3] reported that perforation of the dura had occurred only twice in more than 1,000 injections.

The best treatment for this unwelcome accident is prevention, and the test dose I believe is the best method available to avoid a massive subdural injection. It is further recommended that a test dose of 5 to 8 cc. be repeated ten minutes prior to each subsequent injection. This is especially important when the needle technic is used, since the needle may pierce the dura at any time during the procedure. This apparently occurred in the case reported by Small.

A thorough knowledge of the normal anatomy of not only the bony sacrum and sacral canal but also the dural sac and spinal cord is important and indeed fundamental if one is to administer caudal anesthesia intelligently and safely. The spinal cord normally ends at the level of the first lumbar vertebra, with the dural sac containing spinal fluid and the cauda equina tapering to a point in the sacral canal at the level of the second sacral vertebra. The contour of the lower end of the dural sac is not constant but varies with straining, jugular compression and other forces, as has been shown by x-rays after introduction of opaque substances. The sacral canal is continuous with the epidural space in the vertebral canal and extends all the way to the foramen magnum. Anatomic variations in the sacrum are common and may at times interfere with the proper insertion of the needle.

The important fact that the dural sac may extend lower than the second sacral vertebra should be kept constantly in mind. If the patient is thin and the sacrum short, the use of a 2½ inch rather than a 3 inch needle lessens the danger of perforating the dura. This complication also seems less likely when the catheter method is used. There is a continuation of the dura around each of the nerves in the sacral canal for a variable distance, as can be seen in the illustration.

Eli Lilly & Co. furnished the metycaine used in this study.
Dr. William J. Dieckmann and Dr. H. Close Hesseltine gave helpful criticism of the manuscript.

From the Department of Obstetrics and Gynecology of the University of Chicago and the Chicago Lying-in Hospital.

1. Zweifel, E.: Die Todesfalle bie Sakralanästhesie, Zentralbl. f. Gynäk. **44**:140, 1920.
2. Eastman, Nicholson J.: Personal communication to the author.
3. Hingson, R. A., and Edwards, W. B.: Continuous Caudal Anesthesia in Obstetrics, J. A. M. A. **121**:225 (Jan. 23) 1943.
4. Gready, T. G., and Hesseltine, H. C.: Continuous Caudal Anesthesia in Obstetrics, J. A. M. A. **121**:229 (Jan. 23) 1943.
5. Block, Nathan, and Rochberg, Samuel: Continuous Caudal Anesthesia in Obstetrics, Am. J. Obst. & Gynec. **45**:645 (April 1) 1943.
6. Small, M. J.: A Serious Complication of Caudal Anesthesia, J. A. M. A. **122**:671 (July 3) 1943.
7. Brown, Hugh O.: Personal communication to the author.

It is theoretically possible for the point of the needle to pierce this dural sheath, thus permitting the injected solution to dissect up into the subarachnoid space. Such a puncture of this nerve sheath and subsequent injection may cause pain and so give some warning.

Should the recommended precautions be disregarded and massive spinal anesthesia occur, treatment should be instituted immediately. The patient should be supported in a sitting position, and a lumbar puncture should be done using a large needle so that the fluid will flow rapidly. Walker [8] recommends that approximately 100 cc. of spinal fluid be withdrawn. The flow can be hastened by compression of the jugular veins in the neck. Forced drainage may also be accomplished by giving 0.45 per cent saline solution intravenously while the lumbar puncture needle is in place. Hypertonic dextrose solution would decrease the amount of spinal fluid and thus retard drainage. It is extremely important that the fluid be drained off before the drug has reached the vital centers in the brain. Even though the respiratory center is anesthetized, the method should still be tried in order to prevent involvement of the vasomotor center, which is at a higher level. Drop in blood pressure and shock are combated in the usual manner with ephredine, stimulants and intravenously injected fluids, such as plasma. Respiratory paralysis must be treated by artificial respiration. The presence of a physician anesthetist skilled in the art of intubation and resuscitation might prove life saving, as it undoubtedly did in 2 of the cases reported.

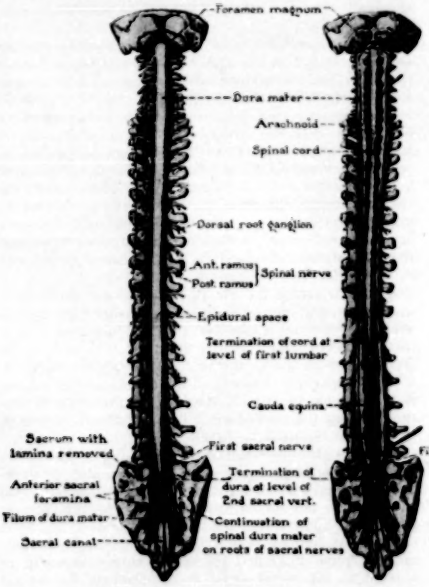


Diagram showing the relationship of the dural sac and cord to the epidural space and to the sacral and the vertebral canal (after Toldt, Karl: Atlas of Human Anatomy, New York, Macmillan Company, 1926).

8. Walker, A. Earl: Personal communication to the author.

INFECTION

Because its appearance is usually delayed, infection is sometimes overlooked as a complication of caudal block. It ranks second in importance to massive spinal anesthesia. It may occur either in the tissues outside the sacral canal or in the epidural space. The latter is more serious because of its proximity to the cord and nerves of the spinal and sacral canal. It may be extremely dangerous and even cause death. That the epidural space is much more susceptible to infection than the subarachnoid space is suggested by experiments on monkeys. Cultures of virulent organisms were injected directly into the spinal fluid without causing any evidence of inflammation.[9]

Edwards and Hingson [10] recently reported a death from infection in a series of 650 obstetric cases. An epidural abscess developed with which there were no localizing signs or neurologic manifestations. The patient was treated with sulfonamides but died on the thirty-first postpartum day. Postmortem examination revealed multiple small pulmonary abscesses and a large abscess involving the peridural space and communicating through the foramina with a subpsoas abscess. The infection had not penetrated the meninges.

Carlisle [11] reported a death following continuous caudal anesthesia of a patient aged 70. After laparotomy a large necrotic, sloughing ulcer developed over the sacrum which extended to the bone. Death on the twentieth postoperative day was believed to have been due to this infection. However, since autopsy was not permitted it is not known whether or not the epidural space or the meninges were involved.

Siever and Mousel [12] in their series of 300 cases had 1 case of epidural abscess. They report "the patient was seriously ill for three weeks but responded to large doses of sulfonamide compounds and completely recovered."

Manalan [13] reported staphylococcic meningitis occurring after 1 of 46 single caudal injections made with the catheter technic. On the third postpartum day symptoms of malaise, headache and hyperirritability developed. No local infection in the sacral canal could be determined by aspiration. The statement is made that "she recovered completely following a critical illness." The complication was believed to have been due to sacral block, but this was never proved.

In 1927, following an attempt at sacral block, Hall [14] reported a death from gas bacillus infection. Southworth, Edwards and Hingson [15] reported low grade cellulitis about the sacral hiatus in 1 case in a series of 255.

9. Walker, A. Earl: Unpublished data.
10. Edwards, W. B., and Hingson, R. A.: The Present Status of Continuous Caudal Analgesia in Obstetrics, Bull. New York Acad. Med. **19**: 507 (July) 1943.
11. Carlisle, William T.: Personal communication to the author.
12. Siever, James M., and Mousel, L. H.: Continuous Caudal Anesthesia in 300 Unselected Obstetric Cases, J. A. M. A. **122**: 424 (June 12) 1943.
13. Manalan, S. A.: Caudal Block Anesthesia in Obstetrics, J. Indiana M. A. **35**: 564, 1942.
14. Hall, L. S.: Report of a Case of Septicemia Following a Sacral Anesthetic, Am. J. Obst. & Gynec. **14**: 256 (Aug.) 1927.
15. Southworth, J. L.; Edwards, W. B., and Hingson, R. A.: Continuous Caudal Analgesia in Surgery, Ann. Surg. **117**: 321 (March) 1943.

The principal etiologic factor in this type of case is obviously faulty technic. Extreme care should be taken in the sterilization of the apparatus and in the preparation of the solution. The site for injection normally is not the cleanest part of the body, situated as it is close to the anus. It should be as thoroughly cleaned and prepared as for a major surgical procedure. Rigid asepsis is of the utmost importance. If the needle technic is used, the only bacteriologic weak point in the equipment once the tubing is connected is the plunger of the syringe. Since the anesthesia is sometimes carried out over a period of hours, it is not at all improbable that during one of the many injections the plunger may be accidentally contaminated and then, on a subsequent injection, bacteria may be introduced into the sacral canal.

Symptoms of epidural abscess at first are those of systemic infections in general, such as malaise, fever and leukocytosis. According to textbooks,[16] the symptom which first focuses attention on the spinal region as the site of infection is usually pain in the back, which may be exaggerated by coughing, sneezing, jugular compression or movement of the spinal column. There also may be tenderness over the spine in the region of the abscess. Radicular pains at the site of the abscess are common, and there may be hypesthesia or numbness in the dermatome supplied by the nerve roots involved. If the abscess is situated in the lumbar region, spinal puncture should not be done because of the danger of penetrating the abscess with resultant contamination of the subarachnoid space. Bagley and his co-workers [16] recommend surgical drainage as soon as the diagnosis of abscess is established. This often necessitates laminectomy. Accessory measures, such as the use of sulfonamides, blood transfusion and the injection of a specific antitoxin, should be employed. Siever and Mousel [12] treated their patient with sulfonamides alone. She survived. The help of a competent neurologist may be of much value in locating the site of infection.

Local infection about the site of injection does not present such a problem as infection in the epidural space. There the management is the same as for other superficial infections. In our series so far we have had no infection of the epidural space nor have we had any local infection of the skin.

INTRAVENOUS INJECTION

Intravenous injection of the drug is another complication which cannot always be avoided. The minimum lethal intravenous dose of procaine in animals has been found to be one-tenth the amount necessary to kill the animal if given subcutaneously.[17] Preliminary aspiration must always be carried out to minimize this danger. If blood is obtained the position of the needle must be changed until blood can no longer be aspirated, and then the injection should proceed slowly and expectantly. We have had 1 case in which this complication occurred. In this instance no blood appeared on preliminary aspiration, and with the patient in the knee-chest position the 8 cc. test dose was administered. The patient was then turned on the left side. In ten minutes 25 cc. of a 1.5 per cent metycaine hydrochloride solution was injected. The patient immediately became irrational, talked incoherently and underwent mild clonic convulsions of both upper and lower extremities. Slight opisthotonos was present. This reaction lasted about two minutes and disappeared spontaneously before treatment could be instituted. We are certain that the fluid went intravenously for three reasons: (1) The needle and approximately 1 foot of the pressure tubing was found to be filled with blood; (2) absolutely no anesthesia developed although a total of 33 cc. of the drug solution was injected; (3) the needle was reinserted and the caudal anesthesia carried out successfully and without reaction for the remainder of the labor. Possibly the 5 patients reported by Lahmann and Mietus [18] as becoming "irrational" and developing "clonic convulsions" received a certain amount of the drug intravenously. In these cases the reactions also passed off in a few minutes without serious effect. Cases are on record, however, in which intravenous injection of procaine has proved fatal. The toxicity from these drugs can be due to three factors: (1) rapid absorption, (2) intravenous injection and (3) idiosyncrasy. In richly vascular areas, such as the epidural space, rapid absorption is likely to take place.

Treatment for the condition is more or less specific and is the same as that for an overdose of the drug. The excellent work done on the toxicity of cocaine, by Tatum, Atkinson and Collins,[19] using rabbits and dogs, proved that the various barbituric acid derivatives are of distinct value both in prophylaxis and in treatment. They showed that the prophylactic administration of a mixture of barbital sodium and paraldehyde to the dog raised the minimum lethal dose from 26.7 mg. per kilogram to above 100 mg., representing approximately a fourfold increase in tolerance. In severe reactions due to overdosage death may occur from either paralysis of the heart muscle or respiratory paralysis during a convulsion. It is imperative that respiration be maintained, by artificial means if necessary. One of the quick acting barbiturates, such as evipal sodium or pentothal sodium, should relieve the convulsions immediately. When caudal anesthesia is used, it is wise to have one of these drugs readily available. In our case the reaction had disappeared by the time the drug was prepared for administration; so it was not given. Since the barbiturates counteract the untoward effects of the local anesthetic, the administration of one of them is indicated as preoperative medication when this type of anesthesia is to be used. Rapid absorption may be delayed by the addition of epinephrine to the solution.

IDIOSYNCRASY

Sensitivity to locally employed anesthetic drugs may occur, one of the most dangerous types being that manifested in the anaphylactic reaction. Every patient should be questioned prior to the initial injection as to a history of allergy and especially as to previous reactions to these drugs. Practically every patient has had a tooth pulled at one time or another under local anesthesia. If a reaction occurs, its management should be the same as for any other anaphylactic reaction, namely the immediate hypodermic administration of

16. Bagley, J.; Grant, F. C., and Horrax, G.: Infections of the Nervous System and Its Coverings in Neurosurgery and Thoracic Surgery: Prepared and Edited by the Subcommittee on Neurosurgery and Thoracic Surgery of the Committee on Surgery of the Division of Medical Sciences of the National Research Council, Philadelphia, W. B. Saunders Company, 1943, chapter 5.

17. Gilman, S.: The Treatment of Dangerous Reactions to Novocain, New England J. Med. **219**: 841 (Nov. 24) 1938.

18. Lahmann, A. H., and Mietus, A. C.: Caudal Anesthesia: Its Use in Obstetrics, Surg., Gynec. & Obst. **74**: 62 (Jan.) 1942.

19. Tatum, A. L.; Atkinson, A. J., and Collins, K. H.: Acute Cocaine Poisoning: Its Prophylaxis and Treatment in Laboratory Animals, J. Pharmacol. & Exper. Therap. **26**: 325 (Dec.) 1925.

epinephrine hydrochloride. Convulsions, should they occur, are controlled by using barbiturates intravenously, care being taken not to give an overdose.

INJURY OF NERVE ROOTS

Judging from the paucity of reports in the literature, injury of the nerve roots in the caudal canal does not often occur. I report some observations from a case which occurred in Hawkins's [20] practice in Chicago:

> With the needle technic, continuous caudal anesthesia was maintained for nine and one-half hours. A total of 215 cc. of a 1.5 per cent metycaine hydrochloride solution was given. On the second postpartum day the patient complained of pain in the region of the sacrum, tingling and numbness of the left great toe and anesthesia of the perineum. When the patient was allowed to be up, she continued to have saddle anesthesia and complained of numbness and burning in the region of the great toe. Her gait was definitely affected, with a tendency to place the right foot forward, much like a tabetic patient. Two months later she was again seen by a neurologist, who reported "There is slight difficulty in hopping on the right foot, and she can walk on her toes better than on her heels; gait and station are not otherwise affected. There is rather marked weakness of the anterior tibial and peroneal muscles on the right side and of extension of the toes. There is slight weakness of the muscles of the right calf and of plantar flexion of the feet and toes. Some impairment to pinprick was present over the right foot, on both dorsal and plantar surfaces. There was also slight hypesthesia to pinprick in the saddle area bilaterally. This patient presents evidence of injury to the fourth and fifth sacral roots bilaterally and to the first sacral and fifth lumbar roots on the right side."
>
> From the history, improvement was taking place and the prognosis for ultimate recovery was believed good.

BREAKING OF THE NEEDLE

The complication of a broken needle has not yet occurred in our series, although of necessity we have used some needles more than five times. Hingson and Edwards [21] reported 12 cases of broken needle out of a series of 850. In 4 instances a small incision was necessary for removal. Their last 250 consecutive procedures were done without a break. Block and Rotstein [22] were unable to remove a broken needle from the canal, so they left it in place.

A broken needle should be removed immediately lest it migrate farther into the sacral canal and become inaccessible.

Cathelin [23] reported a case in which the needle fragment was recovered from the body of the fourth lumbar vertebra at autopsy six months later, and Meeker and Scholl,[24] a case in which removal of the posterior wall of the sacrum was necessary to recover the needle.

The incidence of this complication has been considerably reduced since the development of the malleable needle and catheter technic. The danger can be still further minimized by keeping the patient on her side during labor and then giving an injection and removing the needle just before she is placed on her back for delivery. It is suggested that the needle not be withdrawn until the obstetrician is certain that the cervix is completely dilated and the patient ready for delivery.

20. Hawkins, Robert J.: Unpublished data.
21. Hingson, R. A., and Edwards, W. B.: Comprehensive Review of Continuous Caudal Analgesia for Anesthetists, Anesthesiology **4**: 181 (March) 1943.
22. Block, Nathan, and Rotstein, Morris: Continuous Drip Caudal Anesthesia in Obstetrics, J. A. M. A. **122**: 582 (June 26) 1943.
23. Cathelin, F.: Les injections epidurales par ponction du canal sacré et leurs applications dans les maladies des voies urinaires, Paris, J.-B. Ballière & fils, 1903, p. 231.
24. Meeker, W. R., and Scholl, A. J.: Sacral Nerve Block Anesthesia, Ann. Surg. **80**: 739 (Nov.) 1924.

CHANGES IN BLOOD PRESSURE

Mild and severe vasomotor reactions developed more often than has been reported by most investigators. Shaw [25] in 1925, however, using the single injection method in urologic practice, described changes similar to those which my associates and I have observed.

The relaxation of a patient in labor, after the pains have been relieved and the anxiety has subsided, usually causes a slight fall in blood pressure. Fifteen patients had slight chills and complained of having the "shakes" but not being cold. Such complaints represent a mild vasomotor or toxic reaction. Preliminary administration of a barbiturate may prevent it. In our group of cases there were 27 with a drop of more than 20 mm. in systolic pressure. Usually such a change is associated with a feeling of faintness, fatigue and sweating. The face is pale and the pulse weak. Increased respiratory excursion may indicate mild air hunger. One patient complained of severe substernal pain. All the larger changes in blood pressure occurred in patients in whom the level of anesthesia was at or above the umbilicus. The changes undoubtedly were due to splanchnic dilatation as the visceral sympathetic fibers were blocked. Of 39 patients with an anesthetic level at or above the umbilicus, 26 showed drops of more than 20 mm. Two patients definitely had shock reactions, the systolic pressure dropping to zero from 158/110 and 90/60 respectively. In 2 instances slowing of the fetal heart rate was noticed during the period of lowest pressure. Every one of these patients responded to ephedrine sulfate administered hypodermically and oxygen inhalations. In 19 patients the anesthesia was pushed to a high level in preparation for cesarean section. The drop in blood pressure could have been minimized in this group by preliminary administration of ephedrine. Patients with severe heart disease probably would not tolerate the increased cardiac load associated with large drops in blood pressure.

Control of dosage to prevent too high a level of anesthesia should eliminate this reaction in most patients during labor. The semi-Fowler position or elevation of the head of the bed tends to keep the anasthesia at a low level, whereas the Trendelenburg position favors an ascending level. Possibly the addition of epinephrine to the solution would also prevent large drops in pressure.

ANTESACRAL INJECTIONS

Owing to variation in the type of sacrum and in angulation of the coccyx it is possible in difficult cases to penetrate the sacrococcygeal joint or the tissue lateral to it so that the point of the needle comes to rest on the anterior surface of the sacrum close to the rectum. This has occurred twice in our series. In both cases there was difficulty in identifying the sacral hiatus. One of the patients had evidence of ricketts. In cases in which the anatomy is obscure, preliminary rectal examination with palpation of the sacrococcygeal joint is helpful in preventing this error. If the infant's head is low, it is conceivable that the rectum flattened against the sacrum may be penetrated. The accident occurs more frequently with beginners and in most instances represents carelessness.

25. Shaw, E. C.: Epidural Anesthesia for Perineal Prostatectomy: An Experimental and Clinical Study with Report of One Hundred Consecutive Cases, J. Urol. **15**: 219 (March) 1926.

V 1
194

COMPARISON OF METHODS WITH REFERENCE TO COMPLICATIONS

Two principal methods are advocated for this type of anesthesia, the malleable needle technic originated by Hingson and Edwards and the catheter modification described by Adams, Lunde and Seldon [26] and Manalan.[13]

Since we have used only the malleable needle technic, we do not have two series to compare; however, logically, different methods are devised because they avoid certain complications.

The advantage of the catheter technic aside from the fact that it allows greater freedom of movement on the part of the patient is that there is less danger of perforation of the dura or a blood vessel once the needle is withdrawn over the catheter. Three disadvantages are apparent: (1) There is more trauma associated with the introduction of the 13 gage needle; (2) this trauma naturally increases the risk of infection; (3) the number of failures should be increased, owing to the difficulties involved in the insertion of the large needle in some patients.

With use of the needle technic the complications which are increased in number are (1) the perforation of the dural sac after the needle is in place with subsequent intraspinal injection, (2) the broken needle and (3) the possible trauma inside the canal if the needle is manipulated by the patient moving about on her back.

The development of a smaller useful catheter which can be threaded through a 16 gage needle should combine the advantages of the two methods with resulting increased safety.

DO NERVES BECOME REFRACTORY TO LOCAL ANESTHETIC DRUGS?

In general, we have noticed some difficulty in maintaining the effect of the anesthetic that is used over a long period of time. This same observation has been made by Wall [27] and may be due to malposition of the needle. However, the thought has occurred to us that possibly the nerve roots may become refractory to the action of the drug after prolonged anesthesia. We have noticed this phenomenon in 3 cases in which we felt certain that the needle had not become dislodged from its proper place in the caudal canal.

Régnier and Lambin [28] noticed a disappearance of the anesthetic action of dilute solutions of cocaine hydrochloride after prolonged instillation of these on the cornea of the rabbit. The possibility of this occurring in peripheral nerves should be investigated.

5841 Maryland Avenue.

26. Adams, R. C.; Lunde, J. S., and Seldon, T. H.: Continuous Caudal Anesthesia or Analgesia, J. A. M. A. **122**: 152 (May 15) 1943.
27. Wall, David: Personal communication to the author.
28. Régnier, J., and Lambin, S.: Sur la disparition de l'action anesthésique de solutions de chlorhydrate de cocaïne en contact prolongé avec la surface à anesthésier. Essais sur la cornée du lapin, Anesth. et analg. **4**: 497 (Nov.) 1938.

First Description of Pulmonary Circulation.—Around the middle of the thirteenth century an Arabic physician, Ibn an-Nafis, described the pulmonary circulation. This is the earliest description we know, and its rediscovery has put an end to the claims for priority of either Michael Servetus (1553) or Realdus Columbus (1559). However, it is not probable that Servetus knew of his Arabic predecessor, nor has any historical link been established between Ibn an-Nafis and Columbus. Whether, on the other hand, any connection existed between Servetus and Columbus is a question still open for debate.—Larkey, Sanford V., and Temkin, Owsei, in Essays in Biology, Berkeley, University of California Press, 1943.

DEFINITIVE TREATMENT OF SEVERE WOUNDS

LARGE SURFACE TO SMALL AREA

COLONEL JOHN L. GALLAGHER
MEDICAL CORPS, ARMY OF THE UNITED STATES

It is generally understood that the first aim in the practice of surgery and medicine is to get the patient through an ordeal alive, at all times keeping him at the greatest possible distance from the possibility of death. From the surgical standpoint this aim is achieved when the patient arrives at the hospital as a good risk. Yet often the traumatic patient arrives at the hospital in extreme shock, even irreversible shock, when if adequate first aid had been given promptly after injury he would have arrived at the hospital in good physical condition. For example, a patient arrives practically exsanguinated by profuse hemorrhage from an otherwise minor wound, the hemorrhage from which could have been readily controlled by a compression dressing. Similar mischances are usual in all forms of injuries whether they are surface wounds involving extensive areas of the body, crushing injuries of moderate areas or severed blood vessels in small area wounds.

The medical profession has made great strides in the care of these patients at the hospital, but it is my belief that a great deal more can be done for patients with traumatic injuries during the critical period from the time of injury to the time of admission. Since the care of the patient prior to admission to the hospital is in the hands largely of nonprofessional and only briefly trained persons, treatment must be outlined which will be simple in procedure but most effective in functional result. This prehospital treatment should be such that its principles will be carried on into and through hospitalization. It is to this goal that the present paper is directed.

To illustrate my meaning better, a number of cases are presented:

Approximately one year ago 22 men were working in a building about 20 by 30 by 10 feet. This building became filled with gasoline fumes, which ignited, resulting in a violent explosion followed by a total fire. Two men were blasted from the building through the only door, one of them receiving a second degree burn forming a 4 inch band around the lower third of the left leg. Otherwise there was no injury to these 2 men. The negative pressure created by the blast slammed the door shut. The inside of the building became entirely aflame, and the 20 men remaining in the building received fatal or serious flash type as well as slow type burns. It was not possible for any of the remaining men to get out of the building until the fire department arrived, broke in the door and had the fire under control. In the following confusion 2 of the severely burned victims slipped out of the building, ran to a small hospital 3 blocks distant, went into irreversible shock and died without responding to shock treatment. Four were dead when found, and 2 died immediately after reaching the hospital. Except for the 2 men who ran from the building, the patients were placed on litters and conducted to the hospital by ambulances. This particular hospital had only one operating room and an emergency treatment room, necessitating the use of improvised operating rooms.

In accordance with hospital rules, all attendants immediately took cap, mask and gown precautions and by medical officers' orders gave every patient ½ grain (0.032 Gm.) of morphine sulfate subcutaneously. The dead, dying and critically injured practically filled the hallway of the small hospital where they had been placed by the ambulance crews at the direction of the attending surgeon. The stench of the burned human flesh

and clothing added to the horror of the continual cries of pain. The doctors and the nurses present administered morphine to the living and gradually the patients became quiet.

There was a selection made for priority in operation in that the moribund patients were held for shock treatment. The force was divided into teams, with each of the most experienced surgeons having an assistant medical officer and nurse. Each team immediately started blood plasma intravenously, and where necessary, cutting down on the vein. They then proceeded to cleanse the wounds with sterile water and sterile whipped white soap, lavaging away the white soap with sterile cotton that had been saturated with saline solution. Then with sterile spring forceps, sharp dissecting scissors or Bard-Parker knives, complete debridement of all wounds was accomplished.

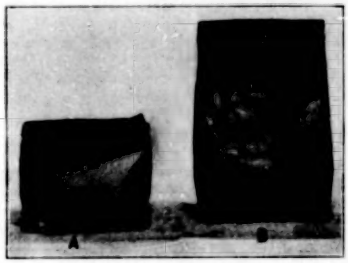


Fig. 1.—The reduction in size of the packaged dressings (*A* new type, *B* original) will be more pronounced when the new type is packed by machinery. *A* is the same dressing as represented in figure 2. (Official photograph, U. S. Army Air Forces Technical Training Command.)

The use of tannic acid-silver nitrate on the trunk and the upper half of each arm was necessary because there was not adequate compression dressing material on hand. If another similar disaster should be encountered, the compression technic would be used entirely, for it is now seen to that sufficient materials are on hand.

It is believed that the patients discussed here were well handled under the circumstances in that all who did not die within fourteen hours recovered to return to full duty. However, it is probable that under the present day management of first aid treatment to the severely burned, had this disaster happened at a considerable distance from the hospital, practically none of them would have survived. The 2 men who ran from the scene of the fire to the hospital and went into irreversible shock illustrate the point clearly. Figures 3 to 8 present a comparative case.

To illustrate the first aid treatment of profusely bleeding wounds by the compression principle, another case is briefly discussed.

A civilian employee was painting lines in an airplane parking area of an airport, when an airplane out of control ran over him. The propeller of the airplane struck him at the right midclavicular area, widely opening his thoracic cavity at the apex. An ambulance driver, parked within a few feet of the accident, rushed over with his ambulance, picked up the injured man, placed him on a litter, saw his profuse bleeding but only became more excited by seeing it, and although there were ample compression dressings in the ambulance, raced madly 6 blocks to the outpatient department of the hospital without applying the dressings. An attendant there saw the profuse hemorrhage, grasped a large packaged compression dressing, ripped off the top of it, placed it on the wound, applied compression with the bandage going under the opposite arm pit, thereby forcing the pad down into the apex of the right chest cavity, and effectively stopped the hemorrhage. The patient was close to exsanguination but was conveyed to the operating room, where he was given plasma, a large blood transfusion, and treatment for shock for two hours without molestation of the dressing. Then, with everything ready, his wound was repaired. He was given another transfusion during the night and still another the next day, following which he progressed to complete recovery.

This case is unusual in that the compression dressing, although at hand, was not used promptly by the excitable attendant. The dressings have been successfully used promptly by personnel in every other similar case, in some of which the tourniquet would have been, as here, of no avail. Such instances clearly illustrate what compression treatment can do for profusely bleeding wounds. Had this dressing been used by the ambulance driver as he had been thoroughly taught to use it, it is reasonably certain that the patient would not have been so near to dying. Had the distance to the hospital been longer, the patient would have arrived dead.

DESCRIPTION OF NEW TYPE DRESSINGS

All five of the first aid dressings described herein embody the compression technic. The original type dressing (labeled *B* in figure 1) was made to simulate the sea sponge as it would be dampened and all ready in moderate compression. The economy of space gained by packing is illustrated by comparing *A* and *B* in figure 1. The new package as reduced by hand pressure only will be smaller when packed by machinery. The new dressings are made to comply with a demand for a more compact packaged dressing to avoid waste space in shipment and to permit the first aid men to carry a more adequate supply in small first aid bags. These dressings when adequately packed, as by machinery, will occupy but little more space than a package of cigarets, but when released they will have adequate bulk in great depth to cover an area approximately 4 by 4 inches while still in the sponge shape, and when further unfolded, by pulling the short string, they will offer a cover type compression dressing of 36 square inches. The larger dressing is similar to the smaller one, as shown in figure 2 *C*, except that it has a bias cut stockinet bandage anchored to its top. It can also be press packaged for economy of space, but when released from its compressed package it will have its original large bulky sponge of great depth for safe control of external hemorrhage from large wounds, up to 5 by 5 inches, plus the advantage of an elastic bandage for holding the dressing to difficult contours, e. g. those of the head and shoulders and the groin, with a more

Fig. 2.—*A*, new type packaged dressing made impervious by waxing. *B*, dressing with the pressure cap not completely drawn up. *C*, dressing with long string which when pulled leaves the pad ready for use, simulating a sea sponge of great depth. *D*, dressing unfolded to cover 36 square inches in good compression. The large dressing unfolds to cover 81 square inches. (Official photograph, U. S. Army Air Forces Technical Training Command.)

resilient compression. This dressing when unfolded by pulling the short string will cover an area of 81 square inches and retain its compression feature.

My pack for compression treatment of all extensive wounds and for Koch treatment of burns consists of sixteen sterile pads 9 inches square, each pad containing 8 ounces (225 Gm.) of grade 1 mechanic's waste,

Fig. 3.—Patient injured in a gasoline explosion and fire. There were third degree burns of the zygomatic area of the face, of the nose and both ears, the anterior surface of the neck, the anterior surface of the chest, the anterior and lateral surfaces of the upper half of each arm and of the shoulder and of the forearms and the hands. The remainder of the face, including the upper eyelids, the mouth and the chin, showed second degree burns. The aforementioned areas were bordered by wide areas with first degree burns. The primary treatment was completed within two hours after injury. (Photograph by U. S. Army Air Corps.)

covered by one thickness of 44-40 mesh gauze overlying two layers of coarse gauze. Four of the dressing pads have a 5 inch by 5 yard roller bandage of bias cut stockinet anchored to them. The pack also contains two operating caps and three face masks (the extra mask for the face of the patient). The entire package is put up in maximum compression for the purpose of economizing space in shipment to armed forces and in carrying by personnel and to permit hospitals generally to maintain adequate sterile supplies of the dressings for disasters. The final container will be tin 8 by 8 inches. Thus in this small cube there will be adequate, smooth, soft, compressible, sterile surgical pads and elastic bandages to cover 1,296 square inches of body surface (both upper extremities, shoulder girdles and axillas) and also finger individualizer strips, caps and masks. It is further proposed to place instructions on the outside of the package for the handling of severe wounds (burns and other types) in this manner. The principal ingredient of these dressings is mechanic's waste (cotton waste), a waste thread material from textile mills and therefore most inexpensive and plentiful. Grade 1 of this material can be bought in Chicago for 9 and a fraction cents a pound. Compare this price with that of absorbent cotton or that of surgical gauze and the economy will be apparent. From the standpoint of resilience mechanic's waste is the one adequate substitute for the unobtainable sea sponge. Neither absorbent cotton nor waste cotton nor surgical gauze can compare with mechanic's waste in the all important matter of giving resilience to compression dressings. It is a fair absorbent and is readily sterilized.

When firm, safe bandaging is applied over a wound coverage such as this, with ample bulk and good resilience, the dressing continues to cover the wound indefinitely, whereas a dressing of poor resilience will slide off the wound or turn to expose it, even if the bandage is applied so tightly as to cause constriction. This is particularly true when there is a circular bandage about an extremity or the thorax, where there is a constant change in the circumference. If there is a bulk of resilient material beneath the bandage, it will give as the bandage tightens and will spring back to take up the slack as it loosens, to hold the dressing firmly in place. If, on the other hand, there is not resilience in bulk, the dressing pad becomes packed, or the threads of the bandage give (something must give if there is not ample resilience), and the dressing loosens and slips from the wound. This feature of the resilient bulk of the dressing giving when the circumference of a portion of the body increases is an important safety factor in that it prevents a circular bandage about an extremity from accidentally becoming an effective tourniquet subsequent to enormous edema formation or when an arm or a leg becomes flexed after application in an extended position. It is difficult to obtain constriction as one bandages over a bulky dressing of good resilient material when the bandage is going on smoothly in one direction. However, if there are two bandages being applied in opposite directions with each offering force for the other to be pulled against, constriction is likely and gangrene of a member is a real danger.

This entire series of dressings has been devised with the thought of simplifying, for nonprofessional or briefly trained personnel, prompt optimal first aid treatment for the injured. This procedure will enable such personnel to apply efficient, effective dressings, which can be applied by them and maintained in their aseptic condition. The dressing when so applied will serve to control bleeding without the use of the tourniquet, give compression therapy to the wound area, bring about a splinting effect to the wound, so pad an extremity that a hard rigid splint can be applied without further padding and give protection from outside contamination by the sterile bulk of the dressing. Thereby many of the things which cause the patient to go into shock and on into irreversible shock are arrested early and a safe definitive treatment is instituted. The urge to rush is abated and the many injuries done to the patient in frantic haste to get him to the hospital are avoided.

Fig. 4.—Two days after injury. The patient is in a canopy bed. The sheets, pillow case and other material reflect a sterile technic. All visitors and attendants are required to comply with cap, mask and gown regulations. As shown, the entire head, the upper part of the neck, the forearms and the hands have voluminous compression dressings of cotton waste; the ears are fixed with supersaturated absorbent cotton molds. The eyes have been treated with yellow mercuric oxide ointment beneath the bandages. The remainder of the body (chest, neck and upper arms) has been given the standard tannic acid-silver nitrate eschar. (Photograph by U. S. Army Air Corps.)

The patient who would otherwise arrive at the hospital in critical condition because of avoidable shock will arrive there in good shape with the fundamental principles of treatment already under way.

The advantages of the described compression dressings may be summarized as follows: (1) They control hemorrhage from the wound and thus the use of the tourniquet with its hazards, tedious timing and releasing is avoided, and more important they control hemorrhage from wounds where the tourniquet is not applicable;

Fig. 5.—Patient on the third day. The eyes have been exposed by removing the special dressings in that area. There is no edema of the lids or surrounding areas to speak of. Notice the areas of fluid formation beneath the eschar and one or two areas in which it was necessary to excise the eschar (upper right area of chest, left axilla). Thus far the patient has directed his complaints to the tannic acid areas, claiming complete comfort for the hands, the forearms and the head. (Photograph by U. S. Army Air Corps.)

(2) they insure ease and rapidity of aseptic application of primary adequate dressings by the nonprofessional attendant; (3) they facilitate application of dressings to dependent parts, as the under surface of the arm, the groin or the under surface of the chin; (4) they bring a splinting effect to the wound and its immediate area; (5) by pressure they prolong viability of tissue through aiding return circulation from the wound; (6) they obliterate spaces and crevices in wounds by this compression; (7) by their sterile bulk they form a barrier against added contamination; (8) they create a safety factor in that they may remain as originally applied without additional adjustments or changes for a number of days when necessary, as under battle conditions; (9) they permit easy, as well as efficient, application to any wound with or without spurting vessels under such unfavorable conditions as high wind, semidarkness and cramped close spaces as in multiple passenger combat planes; (10) they make a superior type of first aid treatment available at or near the scene of injury for extensive surface injuries, such as burns, frozen members (frost bite), severe abrasions or crushing injuries, and (11) they afford a dressing the bulky resilience of which will give maximum comfort and permit firm, safe bandaging, adequate to hold it indefinitely in place.

PRINCIPLES OF THE COMPRESSION TREATMENT

It is my opinion, substantiated by outstanding surgeons of my acquaintance, that the compression treatment of burns is by far the most logical and successful. My own particular theories as to the success of compression treatment for wounds, whether burns, frost bite, traumatic or surgical wounds, are discussed briefly. The compression aids return circulation from the wound and in so doing tends to prevent edema. In an extensive surface wound, such as a burn, plasma is lost from the blood stream by escape into the tissues, the principal loss being into the tissues and not as formerly thought entirely out of the body by evaporation and drippage. It is therefore most important that the compression treatment be instituted at the earliest possible moment to prevent shock from hemoconcentratio occurring after extensive surface wounds or crushing injuries. Since fluid escaping into the tissues and remaining there as edema will result in the tissue cells being placed in a nonconductive medium, which also seriously compresses them and isolates them from the principal functions of the blood, namely (*a*) oxygenation, (*b*) nutrition, (*c*) phagocytic action and (*d*) elimination of waste products, the prevention of this series of events is to be desired.

It is firmly believed that the additional loss of skin experienced in the tannic acid-silver nitrate method of treatment of severe burns is mainly due to the aforementioned deprivation of the circulation and only slightly to the chemical action of the two agents. The cells which die do so largely because of anoxia of the tissue cells, but infection resulting from delayed phagocytic action also plays a part. Loss of nutrition and failure of elimination of waste products from the cells are due to the abnormal pressure and physiologic isolation resulting from surrounding edema. This theory is substantiated by the fact that severe burns often become infected whatever type of topical application is used unless the compression technic is employed. It is well known that infection rarely occurs when burns are promptly and properly treated by compression whether or not a medicinal preparation is placed on the burned surface. The rapid improvement of a burned, infected surface following compression treatment further substantiates this theory.

The modern concept that a burn is a large surface traumatic wound is of paramount importance in present day treatment. The extensiveness of the wound makes it more hazardous from the standpoint of infection than the ordinary traumatic wound, since there is more surface to receive contamination and a greater area over which the cells of the blood must be distributed in their phagocytic action against invading organisms.

Fig. 6.—After ten days the dressing is removed from the head, the right forearm and the hand. Note the absence of edema of the surgically clean wounds of the head, upper part of the neck and right forearm. The left ear is surgically clean, although bleeding slightly after removal of the dressing. The patient begged that the dressing of the badly burned left forearm and hand not be disturbed since it was so comfortable. (Photograph by U. S. Army Air Corps.)

Prompt precaution against contamination is indicated whatever the nature of the injury, and the greater the raw surface of the wound the greater the need for promptness in adequate protection. With extensive surface injuries, such as burns, severe abrasions or

multiple lacerations, the need for prompt protection against added contamination is even overshadowed by the need to get the wound under adequate treatment. Certainly when such treatment, if initially applied, can serve as a control for severe hemorrhage from the external wound, as a protection against added contamination and as a preventive of edema with its harmful effect on cellular metabolism, it will be advantageous to start this treatment early. To start treatment prior to contamination is the ideal. However, if contamination has already taken place it is of utmost importance to get this treatment under way (1) before the contamination becomes an actual infection, (2) before the increasing loss of fluid from the blood stream causes hemoconcentration with progressive shock and (3) before the fluid elements of the blood have escaped into the tissues to affect adversely cellular metabolism. Compression dressings on burns of the arms, the legs and the trunk, when approaching the total area of these members, help to raise the blood pressure of the patient in shock by compressing the blood vessels in the area and displacing the blood to the larger vessels and the heart for a more favorable volume. I have seen severely burned patients who already were suffering with shock react favorably immediately after the application of such compression dressings to the entire upper and lower extremities.

Fig. 7.—Patient whose chest, ears, nose and zygomatic areas were apparently burned to about the same degree, as he appeared eighteen days after injury. Notice how much further advanced toward recovery are the head, forearms and hands, comparatively. (Photograph by U. S. Army Air Corps.)

Many lives can be saved if optimal treatment will be given patients having severe or extensive wounds before they are subjected to transportation. (When indicated, treatment should be continued while en route.) Prompt effective control of external hemorrhage, proper compression dressing and splinting of all severe wounds, administration of a sedative, intravenous injection of plasma and institution of chemotherapy should be accomplished prior to departure. The patient should not be subjected to transportation if he is developing shock until it is controlled, else it is likely to continue into irreversible shock and subsequent death.

RECOMMENDED PROCEDURE

It is proposed that an adequate simple sterile compression dressing be applied to a severe burn or other large surface wound immediately at or near the scene of injury, especially if the patient is to be moved a considerable distance. The technic is not involved: The persons administering the treatment obtain the multiple pad pack. They remove the top covering and put on the caps and masks taken from the pack. They then apply the patient's mask. Their hands are washed in soap and water followed by alcohol. The patient is given morphine sulfate ¼ to ½ grain (0.016 to 0.032 Gm.) subcutaneously and the first unit of plasma and the chemotherapy are started. The wounds are exposed by cutting away clothing as indicated, and every effort is made to keep the patient warm if the outside temperature is low. The plywood frame which opens to form a splint is then removed from the top of the pack. The draw string is pulled from the end of the muslin bag, presenting two finger individualizers. The first pad will be lifted off by its attached bandage and will be placed on one extremity of the wound. Then subsequent pads will be obtained, placed side by side and fixed with the bandage under moderate pressure. The fourth pad will have another bandage and so on until the package is used up. Other packages are obtained as needed for complete coverage of wounds in compression. The splints from the frames may then be applied without padding.

Fig. 8.—After thirty-five days some areas in the portion that received open treatment require a skin graft. The left ear has cupped a little, but the deformity is not a noticeable one. There have never been indications of infection or edema or complaints of pain in the areas treated by voluminous dressings. None of these areas have any indication for skin grafting. (Photograph by U. S. Army Air Corps.)

The fine mesh 44-40 gauze in my opinion is the ideal substance for contact with the wound. If loose gauze is placed on the wound, it should be saturated with isotonic solution of sodium chloride to keep it smoother, as in the Neal Owen method. Here the gauze is held smooth by the pad to which it is attached. It is my belief that ointments, dyes, topical antiseptics and the like are harmful in certain instances and superfluous in most. However, chemotherapy given orally or intravenously is essential.

These dressings on burns of patients arriving at the hospital should remain undisturbed as treatment unless there is information on the diagnosis card, or otherwise, of gross débris, which would necessitate cleansing, débridement and subsequent reapplication of a compression dressing. Otherwise, to change dressings would subject the patient to added hazards of contamination and perhaps increase his shock. The compression dressings on lacerated and other severe wounds should be removed in a proper surgical unit under aseptic conditions with full protection against respiratory contamination and with provisions such that adequate surgical care can be complete. Even in the case of lacerated wounds it is better to make x-ray search for foreign bodies and leave the dressings intact, if too long an interval has elapsed for safe surgical intervention, until indications arise for their removal. In any case, treat the patient in a logical conservative manner to bring him through the critical period alive, leaving well enough alone. See to it that the blood volume is kept up, that unavoidable losses of blood plasma or cells are replaced; prevent or treat shock, and promptly administer adequate chemotherapy. Keep an accurate record of the fluid intake and output and adjust the intake of fluid accordingly.

SUMMARY

1. The series of compression dressings offered makes possible adequate treatment of wounds, including the extensive surface wounds of burns and frost bite.

2. Three of the compression dressings are packaged with maximum compression for economy of space in shipment in the war effort and in carrying by personnel and to permit hospitals generally to store easily an adequate supply of sterile compression dressings for instant use in mass disasters.

3. The sterile ready-to-go compression dressings are devised to simplify the dressing of severe wounds so that the briefly trained person may become proficient in their application.

4. The oval pads of the individual dressings are designed to have sufficient firmness to collapse injured vessels and stop hemorrhage but to have ample resilience to permit circulation beyond the wound and to the tissue of the wound through the uninjured blood vessels, thus obviating the use of the tourniquet with its hazards.

5. The two new type dressings have a dual purpose, in that they may serve as thick spongelike pads for quick control of external hemorrhage or, by unfolding, may become wide coverage compression dressings.

6. The economy and saving of strategic materials is apparent.

Hospital care and treatment are today superior; generally, however, the critical period from the time of injury to the time of admission to the hospital offers room for improvement. This has been an effort in that direction.

A WORKING CLASSIFICATION OF THE CAUSES OF ABORTION

SAMUEL R. MEAKER, M.D.
BOSTON

The traditional method of classifying the causes of spontaneous abortion divides them into two major groups, fetal and maternal, each of which is again divided into numerous subgroups more or less ill defined. As a practical basis for diagnosis and treatment such an analysis tends to be confusing rather than helpful.

Every accomplished abortion includes three events: death of the embryo, separation of the ovum from its attachments and expulsive uterine contractions. Any one of these may be the primary event in a given case, followed sooner or later by the other two. Thus abortion can be induced by killing the ovum with x-rays, by dislodging it with the curet or by provoking effective uterine contractions with bougies. In the same way spontaneous abortions are initiated by accidents of three general types. A consideration of the causes from this point of view clarifies certain aspects of the problem of clinical management.

DEATH OF THE OVUM

In some cases of abortion the embryo dies days or even weeks before there is any evidence of ovular detachment in the form of bleeding or of expulsive uterine contractions in the form of cramps. In others the embryo, already moribund, dies after some slight appearance of bleeding or cramps but before these symptoms are well established. Such cases are of two sorts. In the first the trouble is hereditary, present from the moment of conception. Faults inherent in the germ plasma may produce anatomic defects; more often they lead simply to a state of insufficient vitality. In the second sort of case the trouble is environmental. A normal ovum succumbs after nidation either because of malnutrition from poor implantation or, less often, as a result of acute or chronic disease in the mother.

To speak first of the last mentioned item, situations in which maternal ill health kills a normal embryo in the uterus offer good examples of primary ovular death. In practice they are relatively uncommon; indeed, it is surprising how sick a woman can be without interruption of her pregnancy. Chemical poisoning, notably by lead, and toxemia from focal infection predispose to abortion, as do also thyroid disorders and diabetes. Malnutrition and avitaminosis appear to have the same effect, though less than one might expect. There is a high incidence of abortion in febrile diseases such as scarlet fever, malaria and pneumonia; and, while in some of these cases the primary event is uterine contractions provoked by high temperature or anoxemia, more often the embryo dies first. On the other hand, maternal syphilis, for all its disastrous consequences in the second half of pregnancy, is relatively harmless to the ovum during the early months.

Mall [1] and others [2] have found that upward of 50 per cent of aborted embryos are pathologic. In Mall's opinion these malformations without exception are produced by environmental factors, chiefly by abnormalities of the uterine mucosa which interfere with nida-

Read before the New England Obstetrical and Gynecological Society in Boston, Dec. 2, 1942.
From the Department of Gynecology of the Boston University School of Medicine and the Gynecologic Service of the Massachusetts Memorial Hospitals.

1. Mall, F. P.: A Study of the Causes Underlying the Origin of Human Monsters, J. Morphol. 19:1 (Feb.) 1908.
2. Hertig, A. T., and Edmonds, H. W.: Genesis of Hydatidiform Mole, Arch. Path. 30:260 (July) 1940.

tion, prevent regular growth of the trophoblast and thus affect the nutrition of the embryo. He states categorically "It is perfectly clear that monsters are not due to germinal or hereditary causes."

There is now, however, a considerable body of evidence to show that defects inherent in the germ plasma can and do cause weakness in the embryo, if not actual malformations. Lethal factors in heredity are well known in lower animals. Something closely analogous has been demonstrated in human beings by Levine and his co-workers,[3] who find that an Rh negative pregnant woman with an Rh husband may produce, as a result of immunization with the Rh fetal blood, anti Rh agglutinins which can penetrate the placenta and hemolyze the blood of the fetus. The type of embryonal weakness most often encountered in practice is due to relative infertility of the spermatozoon or of the ovum, this being caused in turn by constitutional faults in one or both parents such as endocrine disturbances, chronic intoxications, debilitating diseases and poor hygiene. When disorders of this sort are severe they prevent conception; when present in milder degree they deprive the fertilized ovum of that vital energy necessary to carry it through pregnancy. The foregoing facts and others well supported by clinical and laboratory observations have led some workers to ascribe the majority of primary ovular deaths to preconceptional rather than postconceptional influences.

The literature of the past few years contains numerous papers [4] reporting 80 per cent or thereabouts of successes in the progesterone treatment of both threatened and habitual abortion. The fact that a majority of pregnancies in which abortion is threatened can thus be carried to term, with the birth of normal babies, is proof positive that the embryos are not inherently defective. It likewise sustains the views of Mall, for the protective action of progesterone on the decidua would operate specifically to prevent the pathologic sequence of events envisaged by him. Equally definite conclusions about the ovum cannot be drawn from the reports on habitual abortion, since that diagnosis is often little more than presumptive. No doubt the administration of progesterone from the beginning of pregnancy can act prophylactically in the same way as it does therapeutically after a threat of trouble has appeared. When constitutional treatment of one or both partners is carried out before the start of pregnancy, it may be assumed that increased fertility in the parents results in the survival of a certain number of embryos which otherwise would not have had enough vitality to complete their intrauterine development.

SEPARATION OF THE OVUM

The commonest initial event in spontaneous abortions is some degree of ovular separation. Bleeding was noticed before cramps in more than 80 per cent of my cases. Usually the first separation is not extensive; with proper treatment, or even without, healing may occur so that the pregnancy continues uneventfully. Under less favorable conditions further detachment takes place, the embryo weakens and dies, contractions supervene, and abortion becomes inevitable.

There is probably no agent short of instrumental intervention which will bring about the detachment of a normal ovum properly implanted in a normal uterus. Healthy fruit does not fall from the tree until it is ripe. Primary separation of an ovum before the death of the embryo or the onset of expulsive contractions indicates therefore some defect in its attachments, either in the decidua or in the trophoblast.

The formation and the maintenance of a normal decidua depends on two factors: adequate endocrine stimulation and a healthy endometrium capable of responding. As Browne and his associates [5] point out, between the seventieth and ninetieth days of most pregnancies there occurs a transfer from the corpus luteum to the placenta of the function of producing progesterone essential to the integrity of the decidua. If at this critical time or at any other the secretion of progesterone is insufficient (an event often evidenced by a fall in the excretion of pregnandiol), the result is regression of the decidua, disruption of its tissues by internal hemorrhages and separation of villi. A point often overlooked by clinicians is the role of estrogen, of which an adequate production is necessary to prepare the endometrium, pregnant or nonpregnant, for the action of progesterone.

Less frequent as a cause of poor decidual formation is inability of the endometrium to respond to physiologic stimulation. An important item in this category is uterine hypoplasia, which would figure more largely than it does in the causation of abortion were it not that the accompanying hypoplasia of the ovaries makes conceptions few and far between. Inflammatory conditions likewise are more apt to produce sterility than abortion. The older literature has much to say about "decidual endometritis." This term usually represents a pathologic misconception, interpreting as inflammation the dissolution and the infiltration with leukocytes, which are nothing more than a phase of the regression that follows withdrawal of progesterone. Nevertheless infections of the decidua, the placenta and the embryo itself do occur, either through the blood stream or by invasion from the vagina. The hyperplastic endometrium, an end result of more or less prolonged estrogen-progesterone imbalance, can rarely prepare itself for the implantation of an ovum. The same is true of the endometrium of the subinvoluted uterus. This fact may sometimes account for a series of very early abortions, perhaps not recognized as such.

Defects in the trophoblast naturally predispose to ovular separation. Mall reports that the study of comparatively normal embryos often shows that the membranes are decidedly pathologic, the villi being deformed, diseased, atrophic or hypertrophic. Here again, as in the matter of ovular death, it is a question whether the disorder is primarily an imperfection inherent in the ovum or poor nutrition from faulty implantation. The theory has been advanced that the type of placental infarction seen in chronic nephritis may have its origin in disease of the young blood vessels of the chorion.

EXPULSIVE UTERINE CONTRACTIONS

In a minority of cases the threat of abortion is first announced by symptoms of uterine contraction. These commonly start as low backache, with dull pain and a sense of weight in the pelvis; if the process is not checked, they soon develop into rhythmic cramps of increasing severity. Cramps without bleeding, or followed by a show of bright blood, are consistent with the possibility that the ovum is still normal. But when pains have been preceded by days of spotting or brown-

3. Levine, Philip; Burnham, Lyman, Katzin, E. M., and Vogel, Peter: The Role of Isoimmunization in the Pathogenesis of Erythroblastosis Fetalis, Am. J. Obst. & Gynec. **42**:925 (Dec.) 1941.

4. Kotz, Jacob; Parker, Elizabeth, and Kaufman, M. S.: Treatment of Recurrent and Threatened Abortion: Report of Two Hundred and Twenty-Six Cases, J. Clin. Endocrinol. **1**:838 (Oct.) 1941.

5. Browne, J. S. L.; Henry, J. S., and Venning, E. H.: The Significance of Endocrine Assays in Threatened and Habitual Abortion, Am. J. Obst. & Gynec. **38**:927 (Dec.) 1939.

ish staining, one may suspect that the ovum is dying or dead and that the uterus is preparing to rid itself of an embryo which it must inevitably lose.

Apart from any question of endocrine control, there are several anatomic conditions which make growth of the pregnant uterus beyond a certain point difficult if not impossible. Reynolds [6] presents evidence to show that tension on the uterine wall is a factor exciting contractions. The hypoplastic uterus is subject to this handicap because of the relatively large amount of connective tissue in its myometrium. Retrodisplacements, even with adhesions, usually correct themselves during pregnancy; but if the growing uterus becomes incarcerated under the sacral promontory, the mechanical situation soon reaches a crisis. Intramural fibromyomas may create a state of tension to which the uterus cannot adapt itself. The same is occasionally true of deep lacerations of the cervix with extensive scar tissue.

Various external influences evoke contractions in the pregnant uterus. Falls, other bodily injuries and surgical operations can have this effect. Coitus during pregnancy is generally harmless if one may judge by the experience of the large majority of patients; in some cases, however, it undeniably initiates abortion. Violent and painful peristalsis of the intestine may bring on reflex uterine contractions; such action is the aim of many ecbolic drugs. Hunner [7] has called attention to the fact that a similar result ensues in disorders of the kidneys, ureters and bladder. Occasionally abortion is started by a psychic or emotional shock.

It is well known that in respose to each of the two sorts of stimuli just described (mechanical hindrances to growth and external violence) individual uteri react with widely varying degrees of promptness and vigor. Under apparently identical conditions attempts to induce abortion or labor will fail in one case and succeed easily in another. Such behavior postulates a factor of uterine irritability, which in the light of present knowledge would seem to be chiefly if not altogether endocrine in nature. On this subject there has accumulated in the past few years a great number of clinical and laboratory data, some of them contradictory and some inconclusive. The sum total of evidence leads to a few tenable conclusions which may be accepted provisionally as a basis for practice.

Estrogen activates the uterine musculature and tends to stimulate contractions; progesterone has a sedative or inhibitory effect. One might therefore be tempted to assume that excessive muscular activity is due simply to a deficiency of progesterone, either relative to estrogen production or absolute, and that replacement therapy is all that is required to correct the trouble. In some cases of threatened abortion this is no doubt true, as the clinical reports indicate. In general, however, more complicated problems of endocrine physiology are involved. Hamblen [8] points out that the apparent failure of a hormonal function does not prove an insufficiency of the hormone in question; it may occur in the presence of an excess, and in that event attempts at replacement therapy produce undesired results. Specifically, he believes that large doses of progesterone may precipitate abortion by depressing the intrinsic progesterone-pregnandiol metabolism.

While the direct action of estrogen on the myometrium is antagonistic to that of progesterone, there is a synergism of the two hormones in the sense that estrogen serves to support the corpus luteum and to favor the utilization, if not actually the production, of progesterone. Heckel and Allen [9] were able to maintain the corpus luteum of pregnancy and to inhibit parturition in rabbits by injections of estrogenic substances. Karnaky [10] obtained good results in the treatment of both threatened and habitual abortion with massive doses of diethylstilbestrol. Attempts to induce therapeutic abortion by giving large amounts of estrogen and following this with posterior pituitary injection, sometimes also with castor oil and quinine, have been almost uniformly unsuccessful. These facts suggest that estrogen may act indirectly, through an increased production of progesterone, to depress myometrial activity.

Everything considered, it appears that the main cause of abnormal uterine irritability in early pregnancy is an insufficiency of that progesterone effect which is necessary to check the oxytocic action of the posterior lobe of the pituitary. The guiding principle of treatment should be the reestablishment of a normal estrogen-progesterone balance with small doses of one or the other hormone as needed. Vaginal smears provide a valuable method of determining the indications.

A WORKING CLASSIFICATION OF CAUSES

As cases of threatened abortion present themselves in practice, it is frequently impossible to recognize in what way the process began. Separation of the ovum and death of the embryo may be going on *pari passu*, while at the same time the irritable uterus shows signs of activity. Nevertheless the fact remains that in every case the process starts with one of three events. That being so, an analysis of the causes of these events offers a logical working classification of all the causes of abortion as far as they are known. It also suggests lines along which further study of the problem might be undertaken. The major groupings of the classification proposed in this paper are as follows:

I. Death of the ovum
  A. Hereditary faults
    1. Lethal and sublethal factors in germ plasma
    2. Low vitality due to infertility of parents
  B. Environmental faults
    1. Malnutrition from defective implantation
    2. Acute and chronic maternal diseases
II. Separation of the ovum
  A. Abnormalities of decidua
    1. Insufficient endocrine stimulus
    2. Insufficient endometrial response
  B. Abnormalities of trophoblast
III. Expulsive uterine contractions
  A. Factors exciting contraction
    1. Mechanical hindrances to growth of uterus
    2. External violence
  B. Excessive uterine irritability

CONCLUSIONS

Some twenty years ago a clearer definition of the causes of involuntary sterility pointed the way to improved diagnostic and therapeutic methods which have more than doubled the number of successful results obtained.

There is need for an equally systematic approach to the closely related problem of spontaneous abortion. The first step should be a comprehensive and critical survey of the etiology of this type of pregnancy wastage.

475 Commonwealth Avenue.

6. Reynolds, Samuel R. M.: Physiology of the Uterus, New York, Paul B. Hoeber, Inc., 1939.
7. Hunner, G. L.: Ureteral Stricture in Obstetrics, with Special Reference to Multiple Abortions (Renal) and to Pyelitis of Pregnancy, Am. J. Obst. & Gynec. 9:47 (Jan.) 1925.
8. Hamblen, E. C.: Some Clinical Observations on the Endocrinology of Abortion, Am. J. Obst. & Gynec. 41:664 (April) 1941.
9. Heckel, G. P., and Allen, W. M.: Maintenance of the Corpus Luteum and Inhibition of Parturition in Rabbits by Injection of Estrogenic Hormone, Endocrinology 24:137 (Feb.) 1939.
10. Karnaky, K. J.: The Use of Stilbestrol for the Treatment of Threatened and Habitual Abortion and Premature Labor: A Preliminary Report, South. M. J. 35:838 (Sept.) 1942.

THE BIOSYNTHESIS OF THIAMINE IN MAN

AND ITS IMPLICATIONS IN HUMAN NUTRITION

VICTOR A. NAJJAR, M.D.
AND
L. EMMETT HOLT Jr., M.D.
BALTIMORE

The thiamine requirements of man are not known with accuracy. The daily allowances recommended by the National Research Council's committee on medical nutrition were based on three experimental studies of induced thiamine deficiency in human volunteers [1] which did not show very close agreement in regard to the minimal requirement. The difficulty encountered in experiments of this kind, one which we have experienced ourselves, is the great variation in the thiamine content of natural foods, making it next to impossible to maintain a constant intake when such foods are given. In order to avoid this difficulty and to control thiamine intake accurately we undertook experiments on a synthetic diet in which vitamins were supplied exclusively by a vitamin mixture given with each meal in weighed amounts.

The subjects of this study consisted of 9 adolescent young adult males from 16 to 23 years of age, living a sedentary life in an institution. Their diet, which was furnished in quantities approximating 40 calories per kilogram, consisted of vitamin free casein, crisco, dextrimaltose, a mineral mixture [2] and a vitamin mixture.[3] The food was mixed together to form a somewhat granular dough, which was given in equal quantities at each of the three meals. The subjects soon became accustomed to this food and ate it with every appearance of relish. In all, this monotonous regimen has been continued for eighteen months during which time weight and vigor have been maintained.

The plan of the experiment was to vary only the thiamine intake, reducing this very gradually from an initial level of 1 mg. per day in order to ascertain the minimum thiamine intake that would prevent thiamine deficiency. The subjects were given periodic physical examinations; their blood and urine were examined routinely. Electrocardiograms were taken from time to time, and occasional roentgen observations were made on the motility of the gastrointestinal tract. The thiamine excretion in the urine was followed daily, using the "fasting hour" excretion test described by us;[4] occasional observations were also made on the twenty-four hour urinary excretion of thiamine and on the blood pyruvate.

From the Department of Pediatrics, Johns Hopkins University.
This study was supported by grants received from Mead Johnson and Company, the Milbank Memorial Fund and the Williams-Waterman Fund for the Study of Nutritional Deficiencies.

1. Jolliffe, Norman; Goodhart, Robert; Gennis, Joseph, and Cline, J. K.: The Experimental Production of Vitamin B_1 Deficiency in Normal Subjects, Am. J. M. Sc. 196: 198 (Aug.) 1939. Williams, R. D.; Mason, H. L.; Smith, B. F., and Wilder, R. M.: Deficiency and Thiamine Requirements of Man: Further Observations, Arch. Int. Med. 69: 721 (May) 1942. Elsom, K. O'Shea; Reinhold, J. G.; Nicholson, J. T. L., and Chornock, Charlotte: Normal Requirements for Thiamine: Some Factors Influencing Its Utilization and Excretion, Am. J. M. Sc. 203: 349 (April) 1942.

2. Cox, Warren M., Jr., and Imboden, Miriam: A Purified Diet Satisfactory for Growth, Reproduction and Lactation in Rats, Proc. Soc. Exper. Biol. & Med. 34: 443 (May) 1936.

3. This mixture furnished the following daily quantities of water soluble factors, which were divided in three equal doses, one of which was given at each meal: ascorbic acid, 25 mg.; riboflavin, 1 mg.; nicotinamide, 25 mg.; calcium pantothenate, 1 mg.; pyridoxine, 1 mg.; choline chloride, 5 mg.; inositol, 1 mg.; para-aminobenzoic acid, 1 mg.; thiamine, quantity varied as described. In addition, 5 drops of Mead Johnson cod liver oil concentrate was given daily.

4. Holt, L. Emmett, Jr.: The B Vitamins and Certain Problems They Present to the Practicing Physician, Pennsylvania M. J. 46: 451 (Feb.) 1943.

RESULTS

During the course of many months the thiamine intake was gradually reduced without encountering any clinical or laboratory evidence of thiamine deficiency. Thiamine excretion in the urine fell to negligible figures when the intake was reduced to 0.4 to 0.6 mg. per day. By the ordinary thiochrome procedure zero thiamine values were commonly found, but by a more sensitive modification developed by one of us [5] it was possible to demonstrate that quantities up to 2 or 3 micrograms per hour and from 15 to 25 micrograms a day were still excreted in the urine. With further reductions in the thiamine intake no further decrease in urinary thiamine was observed. Eventually, when the subjects had remained on thiamine intakes between 0.1 and 0.2 mg. per day for months, thiamine was omitted altogether from the diet. In the course of the next three to five weeks, 4 of the 9 subjects developed definite clinical evidence of thiamine deficiency (neuritis or edema, in association with anorexia and sometimes vomiting); 1 other subject developed questionable evidence (anorexia and vomiting only) and the remaining 4 subjects showed no signs of deficiency during a seven weeks period of observation.

TABLE 1.—*Output of Free and Combined Thiamine in Feces of Patients on a Completely Thiamine Free Diet*

(Figures represent micrograms excreted per day, an average of periods of one week's duration)

Subject	Symptoms of Thiamine Deficiency	Thiamine in Feces			
		Period 1		Period 2	
		Free Thiamine	Combined Thiamine *	Free Thiamine	Combined Thiamine
C. G.	Present	0.8	152	8.5	27.4
H. K.	Present	5.0	0	4.5	0
A. P.	Present	4.7	111	3.5	0
R. A.	Present	11.5	73	15.6	56
S. B.	Questionable	20.0	217		
C. P.	Absent	250	40	397	129
G. B.	Absent	52	122	27	19
D. K.	Absent	143	0	102	25
J. S.	Absent	58	29	45	201

* Indicates thiamine liberated by treatment with clarase.

Since it seemed likely that the reserves of thiamine had been greatly depleted by the prolonged period of low intake even before the completely thiamine free regimen was instituted, it would have been anticipated that none of these subjects could withstand complete withdrawal for more than a few weeks. An explanation was therefore sought for the failure of the remaining 4 subjects to develop deficiency. Repeated examination of the diet failed to show any trace of thiamine; examination of the stools, however, provided very illuminating information. It was found that the 4 subjects who had developed deficiency had almost no free thiamine in their stools. A somewhat larger amount of free thiamine was present in the subject whose symptoms were questionable, whereas each of the subjects who remained free of symptoms had large quantities of free thiamine in the feces (table 1).

COMMENT

It will be noted that the stools of most of the subjects contained considerable amounts of combined thiamine in some combination that yielded free thiamine on treatment with clarase. However, the close correlation between the symptoms and the low value of free thiamine and the lack of correlation between the

5. Najjar, Victor A.: Unpublished observations.

symptoms and the combined thiamine suggests that the latter may be in a form unavailable to the body. The source of the thiamine in the feces remained to be explained.

Two possibilities to be considered were (1) that intestinal bacteria were manufacturing thiamine, a phenomenon that is known to occur in the rat under certain conditions and in the rumen of certain ruminant animals; (2) that the stores of thiamine in the body had not been completely exhausted and that the fecal thiamine represented an excretion into the intestine. The latter alternative seemed rather unlikely in view of the fact that urinary thiamine excretion had for many months remained at extremely minute levels. The possibility of thiamine excretion into the intestine was tested by administering 50 mg. of thiamine intravenously to 1 subject daily for one week in order to find out whether this was followed by an increased thiamine content of the stools. A negative result was obtained.

In order to obtain direct evidence for the production of thiamine by the intestinal bacteria, one of the symptom free subjects (G. B.) was given succinylsulfathiazole by mouth 1.5 Gm. every four hours for one week. The feces of this subject showed a prompt reduction in free thiamine; from the previous values of 37 and 52 micrograms per day it fell within a week to zero, reappearing a few days after the drug was discontinued. Conceivably this negative result may have been due to direct destruction of thiamine by succinylsulfathiazole or to some interfering effect of the drug on the thiamine determination. Both these possibilities have been explored and ruled out. It is thus clear that the thiamine in the feces had its origin in the intestinal bacteria.

It is conceivable that the fecal thiamine was formed only by bacteria present in the large intestine, a site from which absorption of thiamine is perhaps impossible.

TABLE 2.—*Urinary Excretion of Thiamine Following Administration of Thiamine by Enema*

(Micrograms in twelve hour specimen)

Subject	Before Thiamine Enema	After Two Thiamine Enemas
A	140	1,815
B	162	5,200

If this were the case, the presence of fecal thiamine would not explain the protection from the deficiency which these 4 subjects exhibited. In order to test this possibility, retention enemas containing 50 mg. of thiamine were given to 2 persons on successive days. Twelve hour collections of urine were made before this regimen was started (control period) and on the day the second enema was given. The results (shown in table 2) indicate a pronounced rise in urinary thiamine as the result of the thiamine enemas and provide ample proof that the large intestine can absorb thiamine.

It is not possible to state at the present time that thiamine requirements can be sustained for an indefinite length of time by such thiamine as is formed by intestinal bacteria. It may be that minute amounts of oral thiamine are needed for the growth of the bacteria which synthesize thiamine. The nature of the organisms which synthesize thiamine and the relation of diet to such bacterial synthesis are now under investigation.

The demonstration that intestinal bacteria can synthesize thiamine carries interesting implications for human nutrition. This phenomenon may explain the discrepancies in thiamine requirements found by different observers. Since it is likely that the biosynthesis of thiamine is greatly affected by diet, as is known to be the case in animals, it follows that we must think in terms of requirements on particular diets rather than of requirements in general. It is quite possible that dietary factors other than the thiamine content may explain in part some of the paradoxes in the incidence of beriberi. The possibility of controlling thiamine deficiency by means other than thiamine administration remains to be explored. Finally, we may point out that the inhibition of the biosynthesis of thiamine by a sulfonamide drug has an important clinical implication for the physician who uses these drugs.

Mrs. Blanche V. Richard rendered valuable technical assistance.
This investigation has been aided by a grant from the Josiah Macy Jr. Foundation.

From the Department of Medicine, Long Island College of Medicine, Kings County Hospital Division.

Dr. Walter B. Cannon and Dr. S. R. M. Reynolds read and criticized the manuscript of this paper, for which the author is grateful.

1. Cannon, W. B., and Cattell, McK.: Studies in Experimental Traumatic Shock: V. The Critical Level in a Falling Blood Pressure, Arch. Surg. 4: 300 (March) 1922. Scull, C. W., and Eiman, J.: Physiological and Clinical Basis for Treatment of Shock, Clinics 1: 43 (June) 1942. Wiggers.[3]
2. Seudder, J.: Shock: Blood Studies as a Guide to Therapy, Philadelphia, J. B. Lippincott Company, 1940. Weiss, Soma: Syncope, Collapse and Shock, Proc. Inst. Med. Chicago 13: 2 (Jan.) 1940. Harkins.[4]
3. DiPalma, Reynolds and Foster (footnotes 9 and 11).

THE CIRCULATION IN THE SKIN IN THE SHOCK SYNDROME

COMPARISON OF SIMPLE PROGNOSTIC FEATURES OF CLINICAL VALUE

JOSEPH R. DiPALMA, M.D.
BROOKLYN

"Early diagnosis and early adequate treatment" is a maxim which applies with particular emphasis to the shock syndrome. If impending shock could be suspected and treated effectively before changes in blood pressure and pulse sound the clarion call of approaching death, lives could be saved. Indeed it is even maintained by some observers that when the blood pressure falls and is maintained for an appreciable time below the so-called "critical level" and pulse changes are pronounced, a stage of shock has been attained which is frequently irreversible.[1] Hence the need for simple clinical methods which provide a means of diagnosing impending shock at the earliest possible moment. To accomplish this many attempts have been made; to date not one remains so effective as a serial follow-up of blood pressure and pulse. Among the promising are studies of blood concentration. Unquestionably they are of value in the shock arising from burns. They are not so satisfactory when applied to other types of the shock syndrome.[2]

My purpose in this investigation was comprehensive. It was to establish a physiologic and clinical basis for evaluation of certain features of shock states and to show that a few simple tests of the circulation in the skin are of diagnostic and prognostic importance in various types of the shock syndrome which are commonly encountered. The use of two recently developed methods of studying quantitatively the responses of the smaller blood vessels of the skin have made this possible.[3] The first method measures two aspects of the hyperemic response (vasodilatation) consequent to a standardized period of local ischemia. First is the minimum time required to elicit a given degree of reactive hyperemia. The second is to measure the clearing time for this

response. This it has been shown is an indication of the rate of blood flow in the skin. The second method measures the sensitivity of the small dermal vessels to give the so-called white reaction to graded mechanical stimulation (vasoconstriction).

PHYSIOLOGIC CONSIDERATIONS

Except for Grant, who has stressed the importance of clinical observation of the skin in shock, most observers dismiss the skin with the brief comment that it is pale, sometimes ashen in color, cold and sweaty.[4] Little of a factual nature is therefore known.

Perhaps the best way to approach the problem is to state the commonly accepted view of the pathogenesis of the circulatory failure in the initial stage of the shock syndrome.[5] This may be regarded as three definite but merging phases:

1. Reduction in effective circulating blood volume resulting in diminished cardiac output and diminished venous return. (The cause and mechanism do not concern us here but naturally may include trauma, hemorrhage, massive infection, burns, intestinal perforation or cardiac shock.)

2. Blood pressure maintained by vasocompensatory mechanisms. Pulse may or may not be altered.

3. Result is slowing of the peripheral blood flow. This is demonstrated in the skin by coldness of the extremities, cyanosis of the nail beds and, sometimes, actual stagnation of the blood in the small blood vessels.

It follows, therefore, that closer observation of the circulation of the skin by the use of certain objective tests of the skin circulation, to be described later, will yield important clues of impending shock before it is heralded by a fall in blood pressure or changes in pulse rate. While slowing of the peripheral blood can exist without the patient being in shock (as for example in cardiac failure, myxedema, peripheral vascular disease or in debility) it must be emphasized that the shock syndrome cannot exist in the presence of an adequate peripheral circulation. This truism has been given the attention it deserves in Harkins's recent review.[6] In summarizing the results of numerous investigators who universally found slowing of the peripheral circulation in the early stages of the shock syndrome, he says "All these writers obtained confirmatory results and it seems to be without question that a decrease in blood flow is one of the prime factors in shock. So important and progressive is it that one might almost say that to diagnose shock a lancet to cut the ear or finger and determine the blood flow would prove almost as useful as all the sphygmomanometers ever made. If one were to select a single determination to follow the course of shock, an observation of the peripheral blood flow might be the best to choose."

To test the foregoing hypothesis, the following observations were made.

METHODS AND PROCEDURES

No attempt was made to study just one type of shock. Rather, all patients in whom the faintest possibility of shock existed were seen as early as possible after they were admitted.[7] The following standard procedure was followed with each patient: First, a careful but brief clinical history was secured to establish an etiologic factor. In the physical examination which followed and usually done at the same time as the history, particular attention was directed to the following details: The patient was stripped and remained exposed to the room air. At this point the importance of examining the patient as a whole cannot be too strongly stressed. The skin was examined with the aid of a light of a 60 watt daylight mazda electric bulb.

Blanching Test.—First a rough estimate of the amount of blood present in the skin areas in the trunk, extremities and face was made. This was done by simply pressing the forefinger forcibly into the skin and observing the blanched area for color contrast with the surrounding skin. Naturally, it follows that if the skin can be blanched at all by pressure some blood must be present in it, and the greater the color contrast with the unblanched skin the greater must be the amount of blood originally present. The rate of fill-in of the blanched areas also permits a rough, though very unreliable, estimate of blood flow.

Temperature of the Skin.—Since the rate of blood flow determines the temperature of the skin, perceptible cooling of the skin, especially of the extremities, is an important indication of slowing the peripheral blood flow. It is not advisable to use instruments to do this because they are cumbersome, are not always available, and the exact skin temperature actually means nothing in itself. What is important is to determine if there are any gross differences between the temperature of the skin of the trunk and the skin of the extremities. This can best be done by gentle palpation with the back of the digits of the hand. It is surprising what fine temperature gradation can be detected in this manner. Again it must be stressed that to do this properly the patient must be naked and exposed to room air for at least ten minutes and preferably for a longer period of time. To attempt to palpate skin temperature while the patient is covered by a blanket is ridiculous, and an extremity which has been in close proximity to a warm body will be warm because of direct transference of heat.

In this study, therefore, careful attention was directed to notation of unusual cooling of the skin of the hands and feet as compared to the temperature of the skin of the trunk.

Color of the Skin.—The color of the skin admirably reflects changes in the rate of peripheral blood flow. The best places to observe are the nail beds of the hands and feet, the lips and the cheeks. The observer by himself can become competent in visual judgment of the changes in skin color which are dependent on the amount and state of oxygenation of the hemoglobin present in the blood vessels of the skin in the following manner: Apply a blood pressure cuff to a suitable normal arm held at heart level and rapidly inflate the cuff to a pressure above the systolic level of the subject. Note carefully the skin color changes which attend the complete circulatory stasis. In about one minute the skin of the arm and forearm will become slightly paler and ashen in color, the nail beds very cyanotic. This limb now represents the changes in skin color which are encountered in the average case of shock in which there has been no blood loss. The arterial color which replaces the cyanosis on release of the pressure in the cuff serves to emphasize the type of skin color with excellent circulation. Now if the experiment is

4. Grant, R. T.: Memorandum on the Observations Required in Cases of Wound Shock, Brit. M. J. 2:232 (Sept. 6) 1941.
5. Wiggers, C. J.: Present Status of the Shock Problem, Physiol. Rev. 22:74 (Jan.) 1942. Harkins.[6]
6. Harkins, H. N.: Recent Advances in the Study and Management of Traumatic Shock, Surgery 9:231 (Feb.), 447 (March), 607 (April) 1941.
7. Patients in this study included those in both the open and closed divisions of medicine and surgery at Kings County Hospital. The many members of the staff, both doctors and nurses, gave unstinting cooperation.

repeated, this time the limb held high and the blood drained out of it before inflation of the cuff, the type of skin color changes encountered most commonly in hemorrhagic shock may be observed. In this case extreme pallor of the skin will be noted. Cyanosis can be detected only in the nail beds. Finally, if the experiment is repeated once more with the limb held dependent and blood allowed to collect in it, the skin color changes most frequent in medical types of shock such as that due to massive infection and shock of cardiac origin may be studied. In this case, the limb is plethoric and the color changes are more striking than in the foregoing instances. The bright red arterial blood color first changes to a duller shade of red, perhaps best described as brick red, then purplish and finally deeply cyanotic. Thus it should be realized that a brick red skin color of the palm may denote considerable slowing of peripheral blood flow in a patient with a reason for going into shock. If deep cyanosis is waited for, many cases of impending shock may be missed.

Fig. 1.—The ease with which the reactive hyperemia ring test is done clinically is illustrated. A weighted rubber ring is applied to the skin of the forearm for a period of seconds measured by the stopclock. By trial and error on different areas a threshold hyperemic response is determined. Note that no additional pressure is put on the weight. The forefinger merely balances it. The length of time required for the threshold response to fade is known as the clearing time and is related to rate of blood flow in the skin. In this instance two weights are used simultaneously to speed up the determination.

The Tache Response.—One other clinical method of detecting slowing of blood flow in the skin has been found occasionally useful. This consists in stroking the skin rather forcibly with a blunt instrument such as the end of a ruler or the cap of a fountain pen. This response, best described by Lewis, in a normal skin consists in the appearance in a few seconds of a red line along the exact path of the stroking instrument. Surrounding the red line is an area of pallor and beyond this an arteriolar flare.[8] Our precedure for the shock patient was to stroke simultaneously the skin of the chest in the area just above the breast and the skin of the forearm. Three things were watched for: (1) the length of time required for the red line to appear, (2) whether or not there was a delay in the appearance of the red reaction on the forearm as compared to the chest and (3) the color of the blood which composed the red line. No attention was paid to the presence or absence of the surrounding pallor and flare, as this was found to be extremely variable.

The following conditions denote slowing of the peripheral blood flow: delay in the appearance of the red line beyond five seconds, and especially delay in the appearance of the red line on the forearm as compared to that on the chest. The color of the red line should be bright red. Altered shades of red, varying from brick red to a purplish red and even a deep cyanotic color, denote respectively a more severe degree of slowing of peripheral blood flow.

These four simple clinical tests of the circulation in the skin, while they are of inestimable value in the proper detection and judgment of the severity of the shock syndrome, still leave much to be desired. They are purely of a qualitative and subjective nature and require much experience to be interpreted properly. Moreover, they do not take into account environmental and seasonal factors, which are known to affect profoundly the circulation of the skin.[9] The test to be described obviates these difficulties.

Reactive Hyperemia Ring Test.—It has been found that the disappearance or clearing time of a standardized reactive hyperemia response produced by local ischemia of the skin is related to the rate of blood flow. Proof of this fact and, in addition, a description of the method, physiologic, seasonal, and aging variables, and its application to the clinical evaluation of peripheral vascular disease have been dealt with before in detail.[10] As regards the method of its determination, suffice it to say here that it depends on the application of a weighted rubber ring (weight loading 100 Gm. per square centimeter) to the skin of the flexor surface of the forearm. A stopwatch or a suitable clock is required to time the period of ischemia (application of the weight) and clearing time of the response after removal of the weight. Figure 1 shows the ease with which the test is done clinically. The minimal length of time, expressed in seconds, required to elicit hyperemic rings of uniform coloration, uniform width and with discrete edges is noted as the stimulus time or threshold for a response. The length of time required for the hyperemic rings to fade completely is noted as the clearing time. To establish a base line of seasonal and environmental factors a control reactive hyperemia ring test was done on the observer himself or a suitable normal patient in the same room as the shock patient.

Capillary Sensitivity.—In this investigation one other test was done which, although not clinically applicable because of the complexity of the apparatus and the time involved, supplied important information concerning the reactivity of the smallest blood vessels of the skin. A strength-duration or excitation curve was determined by using a mechanical device capable of varying both the speed and the intensity of application of a stroker along the skin. This was done by finding the least weight in grams at each of five critical speeds of the stroker which produced a limited degree of vasodilatation against a background of vasoconstriction. The curve thus obtained was quantitated by means of the

8. Lewis, Thomas: The Blood Vessels of the Human Skin and Their Responses, London, Shaw & Sons, Ltd., 1927.

9. DiPalma, J. R.; Reynolds, S. R. M., and Foster, F. I.: Quantitative Measurement of Reactive Hyperemia in Human Skin, Am. Heart J. 23: 377 (March) 1942.

10. DiPalma, J. R., and Foster, F. I.: The Segmental and Aging Variations of Reactive Hyperemia in Human Skin, Am. Heart J. 24: 332 (Sept.) 1942. DiPalma, J. R.; Muss, L., and Foster, F. I.: A Reactive Hyperemia Ring Test in the Study, Evaluation and Prognosis of Pedal Lesions Caused by Arteriosclerosis Obliterans and Arterial Embolism, ibid. 24: 345 (Sept.) 1942. DiPalma, Reynolds and Foster.[9]

formula recommended by Lassalle, where excitability, or E, is equal to $\frac{1}{\text{Rheobase}^3 \times \text{Chronaxie}}$. The reciprocal is used so that a low coefficient signifies low excitability, a high coefficient a high degree excitability. Figure 2 illustrates three curves and the coefficient derived from each curve in a patient in shock from massive infection. A full discussion of this method is given elsewhere.[11] The significance of this test is this: Since normal data have already been secured for this response, comparison can be made with the results obtained in the shock syndrome. Moreover, correlation can be made in the various types of the shock syndrome and in different stages with the degree of clinically observed and objectively studied alterations in rate of peripheral blood flow. This will be brought out in more detail later.

RESULTS

Forty-nine cases of surgical and medical shock of various degrees of severity have been closely followed. Eleven additional cases of suspected shock which later proved to have different disease syndromes were also studied. In the interest of brevity, 25 of these case have been selected as a representative sample and summarized in detail in the accompanying table.

Clinical Evaluation.—Review of the results in the table clearly demonstrates the value of the clinical examination of the skin in the shock syndrome. Particularly valuable is the estimation of the amount of blood present in the skin by means of the blanching test. It will be noted that the cases of hemorrhagic shock are the only ones which show definite diminution of blood in the skin. The cases of traumatic shock also often show some diminution of blood in the skin but in our experience never as much as the hemorrhagic ones. It should be pointed out here that mere notation that the skin is pale is not enough. Often it will be found that a patient who looks pale particularly under some lighting conditions actually has considerable blood in his skin when a critical attempt is made to determine this by means of the blanching test. The cases of medical shock such as massive infection and those of cardiac origin invariably show greatly increased amounts of blood in the skin, while those cases observed with ruptured peptic ulcer show diminution for only transitory periods and soon revert to normal filling of the skin even without treatment. Thus mere observation of the amount of blood in the skin gives an important clue as to the cause of the shock syndrome in puzzling cases. In this regard, particularly striking is the case of B. S. Attention to the amount of blood in the skin would have led early to the correct diagnosis, and the life of the patient might have been saved. The clinician should have asked himself the question "Why is it that this patient, who gives a story of blood loss and should have the appearance of hemorrhagic shock, actually has such a great amount of blood present in the skin?" Search at this time for a medical cause for the shock syndrome might have led to the finding of suggestive tenderness and spasticity of the lower abdomen.

As regards skin temperature and skin color, little need be said. The results are clearly summarized in the table. Suffice it to reiterate here that the mere finding of cold hands and cyanotic nail beds does not indicate at all that the shock syndrome is present. On the other hand, they are very suggestive findings when they fit in with the history and other physical findings. Moreover, the insidious onset of coldness and altered skin color in a patient who was previously normal in this regard often presages the onset of the shock syndrome before evident blood pressure changes occur.

The tache response should be done in all cases. It is simple to do and gives information of slowing of blood flow in skin areas (forearm and chest) in which cooling and color changes are not so easy to pick up clinically. The table demonstrates the range of change which can be expected in shock cases.

Reactive Hyperemia Ring Test.—This simple test proved more valuable than all others. It permitted objective determination of alterations in blood flow in the small blood vessels of the skin of the forearm. Reference to the table will bring out first the absence of variation of the readings in the cases of suspected shock from the normal controls. Of particular interest is the case of E. H., who had a systolic blood pressure of about 70 mm. of mercury for eight hours, yet by clinical signs and the reactive hyperemia ring test her peripheral blood flow was normal. The fact that she eventually attained normal blood pressure with just 1,000 cc. of 5 per cent dextrose in isotonic solution of sodium chloride as therapy substantiated the impression that she was never actually in the shock syndrome.

Fig. 2.—Three strength-duration curves on the same patient in shock from massive infection. An instrument capable of critically varying both the duration and the intensity of a stroke along the skin is used to determine these curves. They are quantified mathematically by use of the formula and graphic location of the rheobase and chronaxies as illustrated. The result is expressed as a coefficient reduced to the fourth power to give a simple digit as an idea of the excitability. A coefficient E or excitability above 0.5×10^{-4} indicates an increase in the sensitivity of the small dermal vessels and vice versa.

Three other cases of suspected shock are included in the table because they are particularly illustrative of the type of patient which offers trouble in the determination of the presence of absence of the shock syndrome. The first type is the patient who succumbs to a moderate or minimal amount of trauma. Blood pressure may or may not be lowered when the patient is first seen. Serial follow-up of skin circulatory changes should be done as well as frequent blood pressures and pulses. A change in the skin circulation may indicate the need for more intensive treatment before blood pressure or pulse changes occur. Conversely, a good skin circulation as in case S. A.[1] is a reassuring sign. The second type is a patient who is brought to the hospital with a history of falling suddenly on the street or down a flight of stairs and who incurs some degree of trauma. It is desired to know if the patient has had a cerebral vascular accident which preceded the fall or if the trauma incurred as a result of an accidental fall accounts for the superficial appearance of the shock syndrome. Case L. S. demonstrates the value of observation of skin circulatory changes under these conditions. The third type frequently seen in medical practice is the patient,

11. DiPalma, J. R.; Reynolds, S. R. M., and Foster, F. I.: Measurement of the Sensitivity of the Smallest Blood Vessels in Human Skin: Responses to Graded Mechanical Stimulation in Normal Men, J. Clin. Investigation **20**: 233 (July) 1941.

Observations in

Type of Shock	Patient, Age, Sex	Original Diagnosis	Final Diagnosis	Blood Pressure and Pulse			Clinically Detectable Skin Circulatory Changes on Admission			
					B. P.	P.	Blanching Test	Skin Temperature	Skin Color	Tache Response
Suspected shock	E. H. 24 ♀	Spontaneous abortion with hemorrhage (?)	Acute multiple sclerosis	On admission..	70/50	80	Normal amount of blood in skin	No abnormal cooling of extremities	Good arterial color	No delay; good arterial color
				Recovery.....	110/80	78				
	S. A.[1] 31 ♀	Head trauma (?); fracture of pelvis; fracture of right leg (?); traumatic shock (?)	Nondisplaced fracture of pelvis	On admission..	110/70	88	Normal amount of blood in skin	Slight cooling of fingers and toes	Good arterial color	Simultaneous appearance on arms and chest; good arterial color
				Recovery.....	120/80	80				
	L. S. 64 ♀	Head trauma (?); internal injuries (?); traumatic shock?	Hemiplegia; cerebral hemorrhage	On admission..	0/07	110	Supernormal amount of blood in skin	Hands and feet very warm	Bright arterial color	Immediate appearance; supernormal responses; cerebral tache?
				Deep shock.....	110/70	90				
	A. M. 62 ♀	Coronary occlusion (?); cardiac shock (?)	Myocardial damage, anginal syndrome; arteriosclerotic heart disease	On admission..	90/60	100	Supernormal amount of blood in skin	No abnormal cooling of extremities	Good arterial color	No delay; good arterial color
				Deep shock.....	100/70	94				
				Recovery.....	110/74	82				
Traumatic shock	S. A.[2] 50 ♂	Head injury (?); bilateral leg fractures	Fracture of right tibia and fibula and left tibia	On admission..	82/54	120	Fair amount of blood in skin; hands plethoric	Pronounced cooling of hands and feet as compared to trunk	Cyanosis of hands and lips	Delayed but appear simultaneously on the arm and chest; brick red
				Deep shock.....	100/64	100				
				Recovery.....	120/70	78				
	M. D. 70 ♀	Compound fractures of both legs	Same	On admission..	50/20	100	Small amount of blood in skin	Extreme cooling of the hands and feet	Pronounced cyanosis of hands, feet lips	Decidedly delayed; builds up slowly; tache on arm comes up much later than on chest; cyanotic
				Deep shock.....	60/32	96				
				Recovery.....	120/80	84				
	R. V. 62 ♂	Avulsion of left arm; multiple rib fractures	Same	On admission..	108/60	120	Fair amount of blood in skin	Hands and feet warmer than trunk (only skin on trunk is sweaty)	Moderate cyanosis of hands, feet and lips	Slight delay; appears simultaneously on arm and chest; brick red
				Deep shock.....	110/60	90				
				Recovery.....	120/80	90				
	J. S. 56 ♂	Comminuted fracture of left tibia; fracture of right tibia	Same plus head injury; intracranial hemorrhage (?); hypertensive cardiovascular disease	On admission..	140/70	76	Supernormal amount of blood in the skin	Cold hands and feet as compared to the trunk	Cyanosis of nail beds and lips	Moderate delay in appearance of tache in the arms and chest; fills in with a brick red color
				Deep shock.....	100/70	84				
				Recovery.....	170/100	80				
	G. Y. 69 ♂	Compound fracture of left tibia	Same	On admission..	90/70	84	Normal amount of blood in skin	Moderately cold hands and feet as compared to trunk	Slight bluish tinge of nail beds	No delay in tache response; good arterial color
				Deep shock.....	100/60	90				
				Recovery.....	110/80	88				
	J. L. 37 ♂	Multiple fractures of both upper extremities; fracture of left tibia; hematoma of abdominal wall; internal injuries (?)	Same	On admission..	?	104	Fair amount of blood in skin	Moderately cold hands and feet as compared to trunk	Definite cyanosis of nail beds and lips	No delay in tache response; brick red color
				Deep shock.....	120/80 (leg)	90				
				Recovery.....	140/100 (leg)	86				
	P. F. 64 ♂	Comminuted fractures of both lower extremities	Same	On admission..	50/30	110	Normal amount of blood in skin throughout; pooling in hands and dependent portions of body	Pronounced cooling of entire body	Deep cyanosis especially of hands, lips and feet	Impossible to elicit tache response even with most vigorous stroking except for faint cyanotic response on chest
Hemorrhagic shock	D. B. 45 ♂	Bleeding peptic ulcer	Same	On admission..	84/50	100	Very small amount of blood in skin	Pronounced cooling of hands and feet	Bluish tinge of nail beds and lips	No delay in tache response; brick red
				Deep shock.....	50/30	120				
				Recovery.....	140/90	90				
	J. S. 37 ♂	Bleeding peptic ulcer	Same	On admission..	90/60	140	Small amount of blood in the skin; pale mucous membranes	Pronounced cooling of hands and feet as compared to the trunk	Definite cyanotic color of nail beds	Delayed; pronounced delay in appearance on the arm; cyanotic
				Deep shock.....	80/30	120				
				Recovery.....	120/82+	96				
	H. K. 59 ♂	Bleeding peptic ulcer	Same	On admission..	140/70	84	Fair amount of blood in skin	Moderate cooling of hands and feet as compared to the trunk	Nail beds reddish purple	No delay in tache; brick red
				Deep shock.....	120/60	90				
				Recovery.....	110/70	80				
	A. S. 68 ♂	Bleeding peptic ulcer	Same	On admission..	75/50	108	Bloodless skin	Pronounced cooling of hands and feet; trunk warm	Cyanotic tinge of nail beds	Decidedly delayed; good arterial color
				Deep shock.....	80/50	100				
				Recovery.....	150/80	74				
Ruptured viscus	H. R. 36 ♂	Ruptured peptic ulcer	Same	On admission..	100/60	78	Normal amount of blood in the skin	Slight cooling of hands and feet	Nail beds reddish purple	Slight delay; brick red
				Deep shock.....	120/70	86				
				Recovery.....	110/80	78				
	J. S. 69 ♂	Ruptured peptic ulcer	Same	On admission..	0/0	?	Pooling of blood in palms of hands and in dependent portions of the body	Generalized cooling of the entire body	Deeply cyanotic, almost black, especially palms of hands	Decidedly delayed; comes up very slowly; deeply cyanotic
				Deep shock.....	70/50	120				

* TH. = threshold; C. T. = clearing time (in seconds).

V 1 194

Twenty-Five Cases

Objective Tests of Skin Circulatory Changes								
Reactive Hyperemia Ring Test *			Capillary Sensitivity Coefficient × 10^{-4}			Shock Therapy	Final Outcome	Comment
	TH.	C. T.	On Admission	Deep Shock	Recovery			
On admission..	20	25	0.44	....	0.23	1,000 cc. of dextrose and saline solution intravenously	Recovery	History of a fainting spell, recent marriage, bloody vaginal discharge and very low blood pressure, which entitled admitting physician to make a diagnosis of abortion with hemorrhage; development of definite neurologic signs 24 hours later brought out the true diagnosis
Recovery.....	20	27						
Normal control	20	20						
On admission..	20	22	....	....	....	1,000 cc. of dextrose and saline solution intravenously	Recovery	Because patient was very restless, sweating and asked continuously for water, she was thought to be in impending shock
Recovery.....	22	25						
Normal control	25	30						
On admission..	15	50	....	....	....	Infusion started	Died in 8 hours; cardiorespiratory death	Picked up on street; automobile accident (?); initial blood pressure could not be obtained because of obesity of patient; later on stertorous breathing and peripheral neurologic signs indicated hemiplegia, which was immediate cause of death
Deep shock.....	25	90						
Normal control	30	35						
On admission..	30	40	....	....	....	Morphine	Recovery	Low blood pressure and precordial pain indicated a coronary occlusion; excellent peripheral blood flow was against this diagnosis; compare with cases of cardiac shock below
Deep shock.....	35	45						
Recovery.....	25	40						
Normal control	25	25						
On admission..	20	600	4.50	14.0	0.41	500 cc. plasma, 1,000 cc. blood, 3,000 cc. dextrose and saline solution	Recovery (See graph)	Moderately severe traumatic shock seen early; good response to therapy
Deep shock.....	10	230						
Recovery.....	20	50						
Normal control	15	22						
On admission..	120	900	....	....	....	500 cc. plasma, 1,000 cc. blood, 2,000 cc. dextrose and saline solution	Recovery (See graph)	Some degree of shock due to hemorrhage is possible; amount of blood loss could not be estimated
Deep shock.....	120	240						
Recovery.....	90	120						
Normal control	60	70						
On admission..	180	900	0.62	5.30	0.31	1,000 cc. blood, 3,000 cc. dextrose and saline solution	Died in 24 hours	Probably lost at least 500 cc. of blood; blood pressure did not fall until the very end, but reactive hyperemia ring test revealed extreme slowing of peripheral blood flow; note that capillary sensitivity coefficient rose to 5.30 just before death
Deep shock.....	120	420						
Recovery.....	120	300						
Normal control	15	15						
On admission..	60	210	0.18	0.20	0.13	1,000 cc. blood, 4,000 cc. dextrose and saline solution	Died in 18 hours	Clinical picture indicated that immediate cause of death was head trauma; note that clinical picture and tests denote the shock syndrome despite elevated blood pressure; patient was known to be hypertensive
Deep shock.....	105	600						
Recovery.....	55	200						
Normal control	30	72						
On admission..	75	90	0.18	0.42	0.27	500 cc. blood, 2,000 cc. dextrose and saline solution	Recovery	A mild case of traumatic shock with excellent response to therapy
Deep shock.....	75	125						
Recovery.....	60	75						
Normal control	25	30						
On admission..	105	155	0.46	0.80	0.29	1,000 cc. blood, 500 cc. plasma, 3,000 cc. dextrose and saline solution	Recovery	Blood pressure could not be taken because of extensive trauma to extremities; it was finally taken on the uninjured leg; skin changes indicated early shock and the need for intensive therapy, which was life saving
Deep shock.....	90	210						
Recovery.....	60	115						
Normal control	22	27						
No response to local ischemia even after five minutes of application of the weighted ring			....	....	....	500 cc. blood	Died in 30 minutes	Picked up on the street probably many hours after an automobile accident; included to show terminal changes in the skin as a result of prolonged severe shock; possibly some element of exposure to cold also present
On admission..	180	165	0.61	9.40	0.27	2,500 cc. blood, 500 cc. plasma, 4,000 cc. dextrose and saline solution	Died (See graph)	Despite adequate therapy, bleeding from ulcer could not be stopped by conservative measures
Deep shock.....	240	420						
Recovery.....	120	155						
Normal control	30	35						
On admission..	120	150	0.14	0.92	0.14	1,000 cc. blood, 3,000 cc. saline solution	Died	Initial blood loss of at least 1,000 cc.; patient had been bleeding for two weeks prior to admission; probably inadequately treated
Deep shock.....	180	420						
Recovery.....	90	120						
Normal control	60	90						
On admission..	120	1,080	0.90	1.00	0.58	1,000 cc. blood, 1,000 cc. dextrose and saline solution	Recovery	Clinically a mild case of hemorrhagic shock; patient evidently responded to his blood loss by hypertension instead of hypotension; however, despite this initial hypertension he had pronounced slowing of peripheral blood flow
Deep shock.....	90	600						
Recovery.....	45	70						
Normal control	20	22						
On admission..	80	94	0.13	0.23	0.37	1,000 cc. blood, 1,000 cc. dextrose and saline solution	Recovery	Mild case of hemorrhagic shock; note that peripheral blood flow was excellent despite low blood pressure and pallor of patient
Deep shock.....	50	50						
Recovery.....	45	51						
Normal control	35	35						
On admission..	35	45	1.60	0.97	0.43	500 cc. blood, 2,000 cc. dextrose and saline solution	Recovery	Mild case of shock; operated on immediately with excellent results
Deep shock.....	40	60						
Recovery.....	75	135 (postoperative)						
Normal control	25	27						
On admission..	180	2,400	1.22	9.20	....	500 cc. blood, 500 cc. plasma	Died in 12 hours	Neglected case in terminal shock; note definite evidence of slowing of peripheral blood flow and the poor response to therapy
Deep shock.....	90	600						
Normal control	50	55						

Observations in Twenty-

Type of Shock	Patient, Age, Sex	Original Diagnosis	Final Diagnosis	Blood Pressure and Pulse	B. P.	P.	Clinically Detectable Skin Circulatory Changes on Admission: Blanching Test	Skin Temperature	Skin Color	Tache Response
	R. B. 53 ♂	Ruptured peptic ulcer	Same	On admission..	78/60	130	Normal amount of blood in the skin	Moderate cooling of the hands and feet	Hands brick red	Moderate delay in appearance in arm as compared to the chest; brick red
				Deep shock.....	90/70	160				
				Recovery.....	120/76	80				
Massive infection	B. S. 40 ♀	Spontaneous abortion with hemorrhage	Septic abortion; gangrene of the uterus (autopsy)	On admission..	0/0	?	Supernormal amount of blood in the skin; pooling of blood in the hands	Pronounced cooling of entire body	Purplish-red skin color; deep cyanosis of hands and lips	Pronounced delay in the arm as compared to chest; cyanotic
				Deep shock.....	50/30	120				
				Recovery.....	80/50	100				
	J. B. 42 ♂	Lobar pneumonia	Same	On admission..	125/70	90	Supernormal amount of blood in the skin	Pronounced cooling of hands and feet	Cyanosis of lips, hands and nail beds	Pronounced delay in arm as compared to the chest; purplish red
				Deep shock.....	60/40	120				
				Recovery.....	90/60	90				
	R. C. 45 ♂	Peritonitis; ruptured appendix	Same	On admission..	98/70	90	Supernormal amount of blood in the skin	Moderate cooling of hands and feet as compared to the trunk	Reddish-purple color of nail beds and palms of hands	Pronounced delay in arm as compared to the chest; purplish red
				Deep shock.....	70/50	130				
				Recovery.....	110/74	86				
	A. S. 55 ♀	Meningococcemia	Same; positive blood cultures	On admission..	50/?	96 (Apex)	Extreme plethora of the entire skin	Pronounced cooling of entire body	Deep cyanosis of all skin areas; many petechiae	Impossible to elicit tache except on chest; here it was decidedly delayed and deeply cyanotic
				Deep shock.....	0/0	90 (Apex)				
Cardiac shock	M. R. 53 ♀	Coronary occlusion; hypertensive cardiovascular disease	Same; T_3 type of electrocardiogram	On admission..	110/80	86	Pronounced plethora, especially of the hands and the face	Pronounced cooling of the extremities	Deep reddish purple; cyanosis of the entire skin; deep cyanosis of the hands	Pronounced delay in the tache response
				Deep shock.....	60/30	80				
	E. A. 67 ♀	Coronary occlusion (?); paroxysmal auricular tachycardia	Arteriosclerotic heart disease; coronary sclerosis	On admission..	130/50	90	Pronounced plethora, especially of the face and upper chest	Pronounced cooling of the extremities	Deep reddish purple; cyanosis of the face and hands	Pronounced delay in the tache response
				Deep shock.....	0/0	180				
				Recovery.....	100/60	84				
	J. V. 40 ♀	Rheumatic heart disease; severe mitral stenosis; multiple embolization (?); pulmonary infarct (?); auricular fibrillation	Same plus hemiplegia as a result of an embolus	On admission..	90/60	62	Supernormal amount of blood in the skin; pooling in the hands	Pronounced cooling of the extremities	Trunk is of good color, but extremities are cyanotic	Moderate delay in the arm as compared to the chest; brick red
				Deep shock.....	80/60	60				

* TH. = threshold; C. T. = clearing time (in seconds).

usually known to have heart disease, who has sudden onset of precordial pain and the doctor notices that his blood pressure has fallen considerably. Here again, as in the case of A. M., attention to the circulation of the skin is most helpful in diagnosis and prognosis.

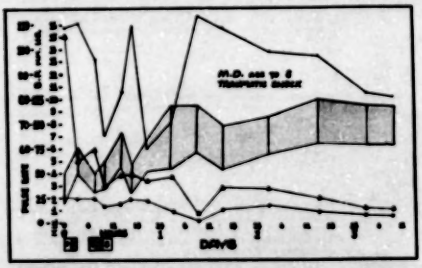


Fig. 3.—A case of traumatic shock as a result of bilateral fractures of the legs. From above downward are pulse, blood pressure (shaded area), clearing time (triangles) and threshold (heavy dots) of the reactive hyperemia ring test. Solid black box is whole blood; box with P is plasma and box with S is saline solution, all in 500 cc. amounts. Note the immediate fall of the clearing time (improved skin circulation) indicating the improvement in peripheral blood flow. Note also that this precedes the relatively slow rise in blood pressure and the great variability of the pulse.

The changes found in the reactive hyperemia ring test in the shock syndrome which results from trauma are shown in the table. It will be noted that in all cases except one the threshold of the response is raised. This is not surprising, since it has been previously demonstrated that two factors known to exist in shock, anoxemia and acidosis, both tend to elevate the threshold. Also of great interest is the observation that hypercapnia will neutralize the effect of acidosis and anoxemia, and it is well known that acapnia is usually present in shock.[12] The changes in the clearing time of the response are even more striking. The rise in clearing time (i. e. decreased blood flow) ranges from three times to sixty times the control value dependent on the degree of slowing of peripheral blood, which obviously varies greatly in different degrees of shock and with seasonal and environmental conditions. From our experience we have set the arbitary rule that a rise in clearing time of three times the normal control clearing time denotes a highly significant degree of slowing of skin circulation in the forearm.

The value of following the clinical course of a patient by means of the reactive hyperemia ring test is clearly demonstrated in the case of M. D. in the table and in figure 3. It will be noted that with therapy the blood pressure did not rise significantly. The pulse was extremely variable. The immediate and persistent fall in the clearing time, however, was a very hopeful sign. Thus, improvement in peripheral blood flow as indicated by the clearing time of the reactive hyperemia

12. DiPalma, J. R.: Quantitative Alterations in the Hyperemic Responses to Local Ischemia of the Smallest Blood Vessels of the Human Skin Following Systemic Anoxemia, Hypercapnia, Acidosis and Alkalosis, J. Exper. Med. 76: 401 (Nov.) 1942.

V 1
194

Five Cases—Continued

Objective Tests of Skin Circulatory Changes								
Reactive Hyperemia Ring Test *			Capillary Sensitivity Coefficient × 10^{-4}					
	TH.	C. T.	On Admission	Deep Shock	Recovery	Shock Therapy	Final Outcome	Comment
On admission..	25	125	0.64	3.13	0.51	1,000 cc. blood,	Recovery	Moderately severe shock relieved by adequate therapy and operation
Deep shock.....	30	140	(postoperative)			2,000 cc. dextrose and saline solution		
Recovery.....	40	60						
Normal control	45	50						
On admission..	60	300	2.10	4.10	....	1,000 cc. blood, 2,000 cc. dextrose and saline solution	Died in 12 hours	History of abortion with loss of blood led to a mistaken diagnosis; later discovered that blood loss had been negligible; absence of skin pallor should have been a dominant physical finding suggesting a more plausible diagnosis than hemorrhagic shock
Deep shock.....	105	420						
Recovery.....	40	180						
Normal control	20	25						
Deep shock.....	60	340	....	....	....	3,000 cc. 10% dextrose, caffeine, intravenous chemotherapy	Recovery	Patient was admitted as having ordinary pneumonia; fortuitous examination of the skin circulatory changes several hours later led to a diagnosis of shock confirmed by blood pressure change; prompt, intensive therapy was life saving
Recovery.....	50	125						
Normal control	55	65						
On admission..	90	220	0.83	3.33	0.20	1,500 cc. blood, 1,000 cc. plasma, 3,000 cc. dextrose and saline solution	Died in 48 hours	The striking thing was the pooling of blood in the skin; open drainage was of no avail
Deep shock.....	90	450						
Recovery.....	80	140						
Normal control	35	35						
No response to local ischemia even after five minutes of application of the weighted ring			....	....	....	500 cc. blood	Died in 6 hours	Included to show pronounced changes in severe terminal shock; the amazing thing was the mental clearness of the patient until the very end
On admission..	45	150	1.10	8.80	....	1,000 cc. 10% dextrose, caffeine	Died in 64 hours	Went on to develop symmetrical, peripheral gangrene of the extremities; remained mentally lucid until the very end
Deep shock.....	25	170						
Normal control	40	45						
Deep shock.....	20	600	....	2.20	0.28	Mecholyl	Recovered from the first attack; died 3 days later	Illustrates forward failure of heart with shock syndrome as a result of tachycardia
Recovery.....	25	180						
Normal control	25	28						
On admission..	60	600	9.40	16.00	....	500 cc. blood, 1,000 cc. dextrose and saline solution	Died in 12 hours	Immediate cause of death was hemiplegia with bulbar failure; note very high capillary sensitivity coefficient
Deep shock.....	105	1,200						
Normal control	20	22						

ring test was the only objective finding on which a good prognosis could be based. Incidentally in this particular patient there was also clinical evidence of improvement in skin circulation by the tests that have been mentioned.

A low blood pressure maintained even for as long as eighteen hours as in this patient does not denote irreversible shock as long as the peripheral circulation remains adequate.

Case S. A.[2] in the table and in figure 4 illustrates another interesting point brought out by these studies. Peripheral blood flow as indicated by the clearing time of the reactive hyperemia ring test may remain relatively slow for a long period and even after the blood pressure has attained normal levels. This is interpreted as indicating that the patient is not yet out of danger despite an elevated blood pressure. Indeed, in this case (fig. 4) improvement in peripheral blood occurred at a time, twenty-one hours after admission, when the blood pressure had diminished considerably.

In hemorrhagic shock the threshold is also elevated just as in traumatic shock. As a rule, however, there is not as pronounced an elevation of the clearing time as in other types of shock. This may indicate that peripheral slowing of blood flow is not so dominant a feature in hemorrhagic shock, especially in the early stages of the shock syndrome.

Case D. B. in the table and in figure 5 again demonstrates the value of peripheral blood flow studies by means of the clearing time of the reactive hyperemia ring test. This patient, suffering from a severe bleeding peptic ulcer, had an initial blood loss of approximately a quart of blood. When first seen his blood pressure was 84 systolic, 50 diastolic, and the pulse rate was 100. There was a moderate slowing of

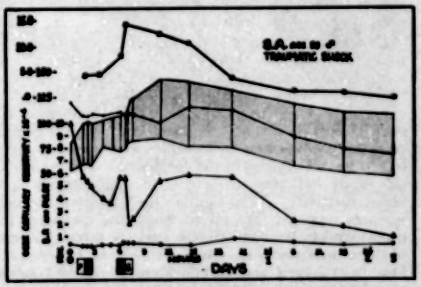


Fig. 4.—A case of traumatic shock as a result of multiple leg fractures. Symbols same as in figure 3 except for addition of the capillary sensitivity coefficient (top line, squares). For complete discussion see text.

peripheral blood flow. Immediate restoration of blood volume with plasma and whole blood brought about quick and satisfactory improvement. Conservative therapy kept him well for seven days. At this time he had another copious hemorrhage which precipitated

much more severe shock. There was now a profound decline of blood pressure (fig. 5) and definite slowing of peripheral blood flow. With transfusion he again improved, his blood pressure attaining almost normal levels. His peripheral blood flow remained considerably slowed for forty-eight hours and then the clearing time began to creep slowly and perniciously upward despite the absence of change in the blood pressure. He died suddenly four days after his second large hemorrhage in spite of transfusions. Here again it must be mentioned that the clinically detectable changes in peripheral dermal blood flow correlated very well with the clearing time of the reactive hyperemia ring test. Thus in this case, as in the other, serial observations on the rate of peripheral blood proved to be a better prognostic sign than alterations in blood pressure or pulse. Lest it be misconstrued that serial studies of blood pressure are of no value in shock, let it be clearly emphasized here that this is not the case. The point which I wish to make is that both studies of blood pressure and peripheral blood flow must be done to evaluate properly the shock syndrome.

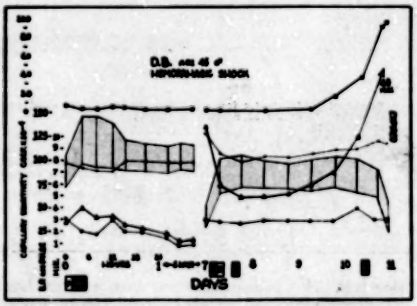


Fig. 5.—A case of hemorrhagic shock as a result of a bleeding peptic ulcer. Symbols same as in figures 3 and 4. For full discussion see text.

The results obtained with the reactive hyperemia ring test in medical shock are summarized in the table and need not be dealt with at length.

Capillary Sensitivity.—In this study it was desired to demonstrate that state of shock is associated with an altered reactivity of the smallest blood vessels of the skin. Former investigations in which the capillary excitability coefficient was determined on over 100 normal persons permits the statement that as a general rule the coefficient is practically never elevated above 0.5×10^{-4}.[13] A rise in the coefficient as determined in this study indicates an increase in small dermal blood vessel reactivity. A fall signifies the opposite. The only diseases reported thus far in which the coefficient has been found to be definitely elevated are certain diseases of the central nervous system. Anoxemia, hypercapnia, local heat, stasis and certain steroids injected subcutaneously are also known to alter the coefficient of capillary sensitivity.[14]

13. DiPalma, J. R., and Foster, F. I.: Sensitivity of the Smallest Cutaneous Blood Vessels: Quantitative Responses to Graded Mechanical Stimulation and to Local Ischemia in Arterial Hypertension, Arteriosclerosis and Certain Allied Disorders, J. Clin. Investigation **21**: 675 (Nov.) 1942. DiPalma, Reynolds and Foster.[2]

14. Reynolds, S. R. M.; Hamilton, J. R.; DiPalma, J. R.; Hubert, G. B., and Foster, F. I.: Dermovascular Change: Dermovascular Actions of Certain Steroid Hormones in Castrate, Eunuchoid and Normal Men, J. Clin. Endocrinol. **2**: 228 (April) 1942. DiPalma, Reynolds and Foster.[2]

When the results of the capillary sensitivity test are averaged for all types of shock presented, it is found that on admission the mean coefficient was 1.56×10^{-4}, during deep shock 4.66×10^{-4} and following recovery 0.31×10^{-4}. Thus it can be seen that even in this small series significant and striking changes in small dermal vessel reactivity are evident. Patient S. A.[2] in the table and figure 4, with moderately severe traumatic shock, demonstrates these changes well. One hour after admission his coefficient was 4.90×10^{-4}. Despite therapy, a slight rise in blood pressure and considerable improvement in peripheral blood flow his coefficient rose to 14.00×10^{-4} in a period of six hours, demonstrating an extreme degree of increase in sensitivity of the small dermal blood vessels to mechanical stimulation. At this point the coefficient began to fall and in twenty-four hours had attained normal levels. This correlated with the clinical improvement, sustained blood pressure and more rapid peripheral blood flow.

In hemorrhagic shock there has not been observed such a large increase in small vessel sensitivity on admission. No significance is attached to this, as the average case of hemorrhagic shock when first seen is not very severe. However, should it become grave the small dermal vessel sensitivity increases, as demonstrated in the table. Patient D. B. (fig. 5) illustrates the ominous rise in small vessel sensitivity before death. It is worthy of note that the rise in the capillary excitability coefficient began forty-eight hours before the final failure of blood pressure and correlated in this case with the pernicious slowing of peripheral blood flow as shown by the lengthening clearing time of the reactive hyperemia ring test. The table illustrates the increase in small vessel sensitivity in deep shock as a result of other causes.

Thus it is evident that the state of shock is associated with an increased responsiveness of the small dermal blood vessels to mechanical stimulation as well as slowing of dermal blood flow. The question of whether or not this increase in small vessel sensitivity precedes slowing of dermal flow and actually is a causative factor (or vice versa) is an important one but unfortunately cannot be answered from the present data. The important point to establish at this time is that slowing of blood flow is not the sole factor in shock; changes in the small blood vessels also play an important role.

COMMENT

It is probably true that many expert clinicians have consciously or unconsciously learned to diagnose and evaluate the shock syndrome by accurate observation of the changes in temperature and color brought about by alterations in blood flow in the skin. However, it is not common knowledge and in general too little stress is laid on it. At the danger of tedious repetition it must be again pointed out that the shock syndrome cannot exist without slowing of peripheral blood flow, that the amount of filling of the skin with blood is important in the diagnosis of the type of shock, that only constant practice can make the physician expert in the clinical detection of slowing of blood flow in the skin and that a clinically useful and simple reactive hyperemia ring test is available for objectively determining changes in the rate of dermal blood flow. Moreover, alterations in dermal blood flow are often more diagnostic and prognostic than blood pressure and pulse changes.

Finally, it must be recognized that slowing of blood flow in the skin, while a very important and clinically useful method of diagnosing and following shock, is not the sole factor present. Alterations in the responses of the small blood vessels are just as much a part of the picture. Unfortunately the latter cannot as yet be readily detected clinically and the exact relationship to slowing of the blood flow remains for future investigation.

Clinical Notes, Suggestions and New Instruments

POSTURE DURING EXAMINATION OF RAPID HEART

I. S. LYON, M.D., ST. LOUIS

During the summer of 1942 while examining a man with a rapid heart, I asked him to lean forward the better to appreciate the auscultatory findings. He responded by bending to a 90 degree angle, when the rate abruptly slowed, apparently because of vagus influence. This was to me something new and was confirmed and since then has been verified in many tachycardias. This slowing occurred in most cases but not all and amounted to about one third of the previous rapid rate and required a full 90 degree angle, for in some cases a bending to something less did not produce slowing. The most pronounced effect came in the first ten to twenty seconds, when a gradual quickening ensued.

Many clinicians have wished to examine a rapid heart when slower and have relied on recumbence to secure this end. A forced expiration after a deep inspiration to slow the heart temporarily is recommended by the American Heart Association or recumbence and waiting for the nervousness to subside. There are murmurs due to a rapid heart action which disappear of course when slowed, as do apical systolic grating murmurs in rapid forcibly beating hearts, which simulate the murmur of mitral stenosis. From time to time in tachycardias difficulty is experienced in identifying the sounds, and pauses and murmurs of an "organic" nature are puzzling to time in the cardiac cycle. The apical systolic murmur is still a perplexing problem in a routine examination and several "tests" are used, such as changes in posture and phase of respiration, to help in separating significant from nonsignificant murmurs, and it would seem that 90 degree bending might be used as an additional procedure, especially in tachycardias—nervous, thyrotoxicosis, flutter, paroxysmal disorders and "neuromuscular asthenia."

While this procedure has been used along with a great many others to influence an attack of paroxysmal tachycardia, a survey of some thirty or forty current textbooks on the practice of medicine, heart disease and physical diagnosis together with an equal number of reports here and especially in Britain of men writing on physical examinations of the heart did not disclose mention of the use of a 90 degree bend for the specific purpose of slowing the heart as an aid in its examination. This procedure is not to be confused with the one commonly used in having the patient lean forward to facilitate auscultation.

From time to time, as opportunity presents itself, an effort is being made to identify this procedure as an aid in specific heart abnormalities. It is hoped that others may try this along with other changes of posture, phases of respiration and so on as an additional aid, particularly in distinguishing "normal" from "abnormal" hearts.

508 North Grand Boulevard.

BILATERAL CONGENITAL MUCOUS CYSTS IN THREE GENERATIONS

THREE GENERATIONS OF MUCOUS CYSTS OCCURRING WITH HARELIP AND CLEFT PALATE

CLAIRE LEROY STRAITH, M.D., D.D.S., DETROIT, AND LIEUTENANT HENRY S. PATTON, MEDICAL CORPS ARMY OF THE UNITED STATES

It is not too unusual for a physician to have in his active years of practice a family with two or three generations of members with harelip, cleft palate or both. Recently we have observed a family in which through three generations there was a tendency to bilateral harelips and also hypertrophy of mucous cysts in the lower lip of each individual with harelip or cleft palate. We believe this unusual distribution of congenital deformities in one family to be of interest to the profession.

In this family of thirteen persons there were in three generations six persons with bilateral harelips. Some of these patients had an associated cleft palate, as might well be expected, but more interestingly each had a pair of hypertrophied mucous glands on the lower lip. These glands secrete a tenacious mucous material from two very prominent excretory ducts which open just above the mucocutaneous line of the lower lip. They are 1 cm. apart and are placed in the center of the lower lip. On the mucous membrane surface they appear to be blue and about the shape of an almond pit. In the adult they measure 2 by 0.5 cm. These glands have been described as mucoceles, retention cysts or congenital fistulas.

Fig. 1.—Five members have had bilateral harelip, cleft palate and mucous glands. The insets show evidence of these deformities in the first and second generations.

Truman W. Brophy [1] pictures these deformities in his textbook on oral surgery. He quoted Sir Arthur Keith's [2] belief that these cysts might be a reversion to a certain species of shark in which such glands occurred. In reviewing the literature and checking with two responsible sources, we can find no such evidence in the Elasmobranchs. It is known that, as certain amphibians assume the terrestrial life, lateral line organs sink beneath the skin and atrophy. This might be an analogue to this condition. Also in fishes the hyomandibular line forms two anterior pores in the lower lip posterior to the symphysis and may be a zoological ancestor to this deformity. In human embryology no clear explanation is to be found for the uniformity and size of these cysts. We do

1. Brophy, Truman W.: Cleft Lip and Palate, Philadelphia, P. Blakiston's Son & Co., 1923, p. 66.
2. Keith, Sir Arthur: Brit. M. J. 2: 363, 1909.

know that mucous cysts occur abundantly in this region and that hypertrophy of the lower lip occurs routinely when there is lack of pressure from opposing tissue, as in harelip. Also we have observed these glands and lips decrease in size after surgical repair of the harelip. We cannot, however, explain to our satisfaction the occurrence of two symmetrical glands when many other such glands are in the vicinity. The occurrence

Fig. 2.—An example of bilateral harelip and mucous glands in the third generation of this family.

must follow mendelian laws in these cases and the glands must have some analogue other than the numerous small mucous cysts found in this region.

In figure 3 we present as accurately as possible the family genetic history. The father had a double harelip, cleft palate and mucous cysts. The mother of the second generation had a congenital syphilitic perforation of the hard palate. This was untreated when her first two harelip children were born.

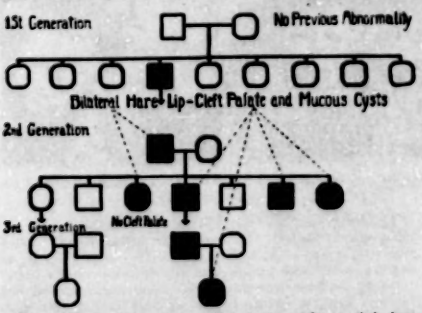


Fig. 3.—Family history, showing high incidence of congenital abnormalities.

This infection was then treated and her Wassermann reaction was negative when the next two harelip children arrived. None of these children have congenital syphilis today. The mother's sisters, however, are under treatment for congenital syphilitic lesions. We do not feel that this disease influenced the frequency of deformities in her offspring. This same mother's syphilitic palate lesion came on spontaneously and healed under antisyphilitic therapy.

In figure 1 some of the members of this unusual family are shown with their bilateral mucous glands of the lower lip.

Figure 2 is an example of double harelip and bilateral mucous glands before surgery.

We have found that simple excision of the gland and some tissue reduces the size of the lip and eradicates the glands. Of course no glandular tissue should be left for fear of recurrence.

CONCLUSION

We report three generations of a family, having six of thirteen members presenting bilateral hypertrophy of mucous cysts associated with cleft palate and harelip deformities. It would appear that in this family the genetic factor responsible for these glands is as dominant as is the harelip factor. Simple excision is the treatment of choice. (These cases are presented as we have not found three generations of bilateral mucous cysts described in the literature before; also because of the relative infrequency of the condition.)

1713 David Whitney Building.

THE TREATMENT OF CREEPING ERUPTION WITH SODIUM ANTIMONY BISCATECHOL (FUADIN)

DUDLEY C. SMITH, M.D., CHARLOTTESVILLE, VA.

Creeping eruption, or larva migrans, is a condition characterized by progressive, linear burrows caused by the larvae of a number of different parasites. The larvae of flies and intestinal parasites have been reported as causing this condition. The larvae are found most abundantly in warm, sandy soil. They penetrate into the epidermis and migrate slowly, causing intense subjective symptoms. The larvae do not penetrate deeper than the epidermis. The majority of cases in this country result from the larvae of the dog and cat hookworm.[1] This abnormality is apparently most prevalent in the southeastern portion of the United States, especially Florida. There have been seen in this clinic 2 cases which were acquired on the beaches of Virginia.

The treatment usually recommended is freezing or cauterization of the skin at the site of the parasite. The parasite is usually present in the area around the advancing end of the burrow within a radius of 1 centimeter. Local treatment in this area is not uniformly successful in producing a cure. In cases presenting a large number of lesions this type of treatment has disadvantages.

Recently (Jan. 22, 1943) a 2½ year old boy was seen at the University of Virginia Hospital with a condition characteristic of creeping eruption. His history is as follows:

In the latter part of September 1942 the patient was living in New River, S. C. His mother first noticed the migrating linear eruption on the left foot. This started as a red spot and advanced in an irregular line. There was intense itching. Later a number of similar lesions developed in the perineal and perianal areas. The symptoms were so severe that the child had difficulty sleeping. A number of local applications failed to give symptomatic relief or improve the condition. No attempt was made to identify definitely the type of larva.

Because of the age of the patient and the location of the eruption, the usually recommended measures for local treatment presented difficulties. Sodium antimony biscatechol (Fuadin), used with success in other protozoal diseases, such as heartworm in dogs and Vincent's stomatitis, was therefore considered for treatment in this case. A 6.3 per cent solution was used, of which 2 cc. solution was given intramuscularly and the home physician was to continue this dosage at daily intervals for five days, discontinue for one week and then give five more similar daily injections. The first injection was given on January 22. On February 24 Dr. J. F. Hubbard, the family physician, reported that the boy was started on 2 cc. intramuscularly daily beginning January 23 and given five doses. After the lapse of a week the medication was started again with 2 cc. intramuscularly daily for three doses. The eruption began to clear up after two or three doses of the first series

From the Department of Dermatology and Syphilology, University of Virginia Department of Medicine.

1. Kirby-Smith, J. L.; Dove, W. E., and White, G. F.: Creeping Eruption, Arch. Dermat. & Syph. 13:137 (Feb.) 1926.

and was entirely gone by the time the fifth dose had been given. The second series was begun, but as the child seemed entirely well and was sleeping all night, which he had not done for a long time, the treatment was discontinued after the third injection of the second series, at his mother's request. There was no recurrence.

On February 15 the patient's mother stated: "From the first injection of Fuadin Bobby's eruption began to dry up, no more has appeared and he has had no bad reaction whatever." On March 13 the boy was examined again. There were no gross or subjective evidences of larva migrans.

COMMENT

Search of the literature reveals no reference to the use of Fuadin in the treatment of creeping eruption. Antimony (formula not mentioned) was used by Cawston[2] without success. The improvement here reported was so prompt and permanent that this record is submitted with the hope that physicians in areas where the infestation is more prevalent will give this agent further trial.

Special Article

AMERICAN HEALTH RESORTS

THE PHYSICAL EQUIPMENT FOR ADMINISTRATION OF HEALTH RESORT TREATMENT

HERBERT ANT
Senior Chemist, the Saratoga Spa
AND
WALTER S. McCLELLAN, M.D.
Medical Director, the Saratoga Spa; Associate Professor of Medicine, Albany Medical College
SARATOGA SPRINGS, N. Y.

These special articles on spa therapy and American health resorts were prepared under the direction of the Committee on American Health Resorts. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the committee. These articles may be published later as a Handbook on Health Resorts.

OUTLINE

I. General Plans
- A. Baths
- B. Hydrotherapy
- C. Hot Mineral Water Packs
- D. Massage and Special Treatments
- E. Inhalations
- F. Mechanotherapy
- G. Mud Baths and Packs
- H. Drink Halls
- I. Linen and Service Rooms
- J. Attendants' Rooms
- K. Swimming and Mineral Water Pools

II. Technical Equipment
- A. Storage
- B. Metals Used for Storage and Distributing Systems
- C. Heating of Mineral Waters
- D. Boiler and Pumping Plant
- E. Laundry Facilities
- F. Bath House Fixtures and Equipment
  1. Bath Tubs
  2. Packs
  3. Hydrotherapy

III. Methods of Cleaning and Sanitation

The successful administration of treatments in a health resort depends to a considerable degree on the physical equipment available and the intelligent use of these facilities.

2. Cawston, F. G.: Creeping Eruption at the Natal Coast, J. Trop. Med. 37: 374-375 (Dec.) 1934.

From the Medical Department of the Saratoga Spa.

I. GENERAL PLANS

The design for any institution depends first on the number of treatments to be given and, second, on whether or not the institution itself provides the entire care of the patient, including living accommodations and treatments. A system of multiple units is presented which can be applied in either the small or the large institution.

The buildings required for administration of treatments will differ somewhat with the type of water and nature of the service provided. Fundamentally, most institutions will utilize mineral waters or muds in some way. Most places are equipped to provide additional hydrotherapeutic treatments, various forms of packs and massage. In some places further specialization may include the use of waters for inhalations, the application of physical exercise as mechanotherapy and the utilization of light and electricity in various forms.

In planning a bathing establishment it is also necessary to determine, as already mentioned, whether it is to be an independent unit or part of a hotel or sanatorium. In the former, adequate space must be provided to allow for the proper rest period following the treatment. If the bathing unit is a part of the hotel, the rest period can be provided by returning the patients to their rooms. This will allow for more rapid turnover of bathing facilities and increase the number of daily treatments per unit to the maximum.

In the bathing establishment the control office provides for the collection of charges, the checking of valuables and the assignment of patients to the various treatment sections. In general, separate sections with duplicate equipment must be provided for men and women. In larger institutions several separate sections may be connected to a central lobby. These sections can be used for either men or women, depending on the requirements.

A. *Baths.*—Provision for bathing is usually made with individual tub units. In a very few resorts the treatments are given in a natural bathing pool. The most practical unit both for privacy and for efficiency consists of a tub room, connected with two rest rooms, all of which must be directly accessible from a hall or passageway. This provides for adequate rest space, service and privacy and allows for more frequent utilization of the technical equipment. The number of such units will depend on the volume of work. Figure 1 is a sketch showing an arrangement of a semiprivate bath and rest rooms.

In some places the strictly private room arrangement is in use. Here the patient has a tub and rest couch in the same room. This private room arrangement is an expensive installation in that it ties up the tub equipment during the entire rest period of the patient, and in general it provides no additional privacy. In some institutions the bathing section may be arranged in a series of treatment cubicles where the bath or other associated treatment is given. The patient is then sent to a general rest room in another corridor. Aside from the inconvenience of going from the treatment room to the rest room and the lack of privacy, this arrangement is particularly satisfactory where the demand for treatments is large.

In any case the particular plan selected will depend on the type of the clientele.

B. *Hydrotherapy.*—A hydrotherapy department is usually separated from other treatment sections and should be complete in itself with hot room, steam room, electric cabinets, rubbing tables, douche stall with control table and resting facilities. In small installations the hot room and steam room may be omitted for lack of space.

Arrangement of the various units in this department for convenient and efficient operation is shown in figure 2. The technical details of these units will be considered in a later section.

C. *Packs.*—In many bathing establishments some form of pack is utilized as an adjunct to the bath or as a separate treatment. In smaller institutions, packs may be prepared in the mineral bath tub. This arrangement generally is not satisfactory because it limits the use of the tub for baths, and frequently proper facilities for preparing the pack cannot be provided. It is much better to have a hot pack department with cubicles adjacent to the bathing section and space for the proper equipment.

D. *Massage and Special Treatment.*—Provisions for massage may be arranged in a separate massage room in the bathing section or it may be given in the rest room itself if it is of sufficient size to accommodate a portable massage table. The first arrangement is satisfactory to the large majority of patients. A few may desire the greater privacy afforded by the second plan.

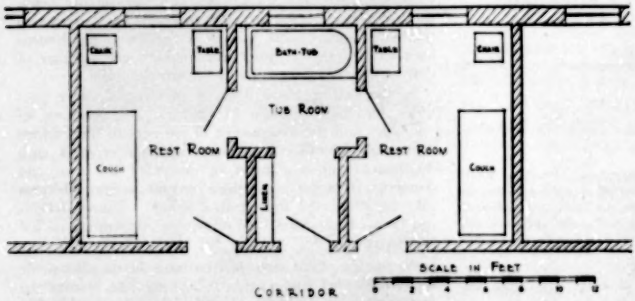


Fig. 1.—A semiprivate bath arrangement.

Additional treatment, such as the use of infra-red rays, ultraviolet radiation and various electrical treatments may be combined in a room similar to that used for massage. Such rooms should be in or near the bathing section, as these treatments are frequently combined with the bath and carried out by the same attendant.

E. *Inhalations.*—The inhalation department is a separate division which can be located in a wing of the bath house or in a separate building. Provisions can be made for three units: first, a large room for group treatment, second, an individual cabin and, third, a table unit in a wall cubicle.

In the group treatment room the atmosphere is saturated with the gases directly from over the mineral water springs or with the finely nebulized vapors of the mineral water. Here the physician has no opportunity of individualizing for his patients unless a series of rooms at different temperatures are provided.

In the individual cabin, mineral water vapors of various concentrations can be given at different temperatures allowing for individualization and economy of operation in small departments. For practical use these cabins are large enough to accommodate one chair and are about the size of a telephone booth.

The wall cubicle allows the patient to sit at a small treatment table or sink, where provision is made for breathing the nebulized mineral waters either through the nose or mouth and where accessory apparatus is available for administering medicated oils in finely nebulized vapors.

F. *Mechanotherapy.*—Mechanotherapy rooms in general are large halls provided with varying apparatus to allow both for general and for local exercise. The apparatus may be either for active or for passive exercise. In the former the patient provides the motive power, while with the passive group some source of power, either central or local, must be provided to operate the machines. If the problem is one of general exercise such as is associated with a reducing program, provision should be made for such types of apparatus as the electric horse or camel, stationary bicycle, rowing machine, chest weights and mechanical and vibratory massage. If the program of treatment is more particularly rehabilitation, then it is necessary to have the types of apparatus which will allow for the exercise of individual joints. A large series of the latter group have been worked out by Zander and can be applied to a wide range of conditions. Their use in this country today is extremely limited. Many physicians prefer to rely on a trained attendant rather than on the machine, which lacks adaptability. The requirements for a complete mechanotherapy unit are large from the standpoint of space and of mechanical equipment. These units are therefore found only in the larger health resorts. In many places, however, a limited number of exercise machines may be used to advantage in smaller space.

G. *Mud Baths and Packs.*—The administration of mud baths calls for elaborate equipment. The necessary means for supplying, storing, heating and preparing the mud for the bath, its transport to the tub and its disposal after use all call for special consideration and attention. For practical purposes mud baths should be considered only when adequate facilities and ample space can be made available. A separate building is most desirable. The bathing unit in this building must be larger than the three room unit described for mineral water baths, as two tubs must be provided: one for the mud bath with a tub adjacent for a cleansing bath following the mud treatment. Therefore the administration of mud baths should be attempted only after careful consideration of all the facilities required.

On the other hand, the use of mud for packs does not require so complete a layout. The pack may be a full body pack omitting the upper chest or it may be limited to local packs on an extremity, the liver region, spinal region and the like. Here the treatment unit can be made up of individual pack rooms or cubicles surrounding a central mud heating unit.

H. *Drink Halls.*—In practically all health resorts, provision is made for the internal use of the mineral waters. The simplest arrangement, of course, is to have the patients go directly to the spring. In some places the mineral water is piped directly from the spring to a special section of the general bathing establishment. In other places a separate building or drink hall provides facilities where many patients can obtain the water as prescribed. Also, if possible, it is of value to have music or concerts during the day when the waters are usually taken. The extent of this phase of the work will depend on the number of patients coming to the health resort for treatment.

I. *Linen and Service Rooms.*—Because of the large quantities of sheets and towels required, an adequate supply can best be maintained if a laundry is run in connection with the institution. Each bathing wing or group of bath rooms should be provided with a linen room in which reserve sheets, towels and other materials used in the actual work of the wing may be stored. The service or linen rooms are usually connected by dumb-waiter with the basement through which the laundry and general service is operated.

J. *Attendants' Rooms.*—In planning a large bathing establishment it is of real importance to provide adequate facilities for the attendants where they may have locker space, shower baths and tables for eating lunch. It has been found that the provision of such space pays dividends in the better satisfaction of the staff and in removing all evidence of street clothing from the patient's vision.

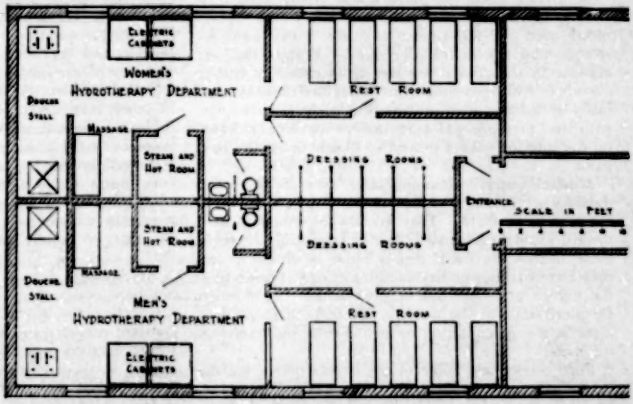


Fig. 2.—Arrangement of units in hydrotherapy department.

K. *Swimming and Mineral Water Pools.*—In many health resorts, provision is made for the utilization of the natural water in swimming pools. These pools are generally provided in a separate building, although in some places they may be a part of the treatment unit. The size of a swimming pool depends on the number of guests to be accommodated. General and technical descriptions for the proper arrangement, operation and control of swimming pools are available.

In some places special treatment pools are provided in which the natural mineral water is used in exercise treatments, either for the patient convalescent from poliomyelitis or for the patient with chronic arthritis. Here the size, shape and necessary provisions for construction have been outlined by Lowman.[1]

II. TECHNICAL EQUIPMENT

Spas are usually built around a mineral spring or group of springs that have some proved medicinal value for either internal or external use or for both. The first and most important consideration, therefore, in the establishment of a spa is the study of the mineral water supply and the equipment necessary to conduct it to the place of utilization.

The first thing to determine is whether or not the supply is adequate and sufficiently uniform in flow and composition to warrant the contemplated development. Considerable time and expenditure of money may be involved in gaining such information. If the springs are shallow natural flowing springs, both the flow and the mineralization may vary at different periods of the year. Therefore, frequent measurements of flow and partial chemical analyses should be made over several seasons to determine such facts. If the wells are artesian in nature and the flow is a natural one there is apt to be less variation, but if pumping is required studies must be made to establish the rate that will assure a uniform mineralization. When it has been definitely established that the mineral water supply is satisfactory, methods of storage and distribution must be planned.

A. *Storage.*—Methods of storage are dependent entirely on the nature of the water, the extent of the supply and the volume demanded. The volume demand at some period may exceed the supply. In such cases larger storage may be required. No set rule can be made to apply to all waters, with the exception that waters that come from the darkness should be kept in darkness.

Light affects all artesian waters in one way or another, such as the promotion of the growth of algae in open reservoirs or the precipitation of iron when exposed to the air.

Waters that contain no volatile gases or salts that would be precipitated may be stored in the covered concrete reservoirs of either a gravity or a pumping system.

Mineral waters containing either carbon dioxide or hydrogen sulfide gas should preferably be stored in closed systems under pressure and entirely free from contact with the air. Such storage will prevent the precipitation of iron and other minerals that are common constituents of gaseous waters. No method is known for the satisfactory storage of waters containing radon (radium emanation).

1. Lowman, C. L.; Boen, Susan G.; Aust, Ruth, and Paull, Helre G.: Technique of Underwater Gymnastics, Los Angeles, American Publications, Inc., 1937.

Waters that flow from the ground at elevated temperatures usually need some cooling before entering the bath tub or treatment room. This cooling can be accomplished by holding the water in storage for a definite time or, as is done in some resorts, by passing the water through radiators which furnish required heat for other purposes.

If water is stored under pressure, proper control must be installed so that the pumps work automatically either directly on the well or from pump chambers into which the spring water flows. If the waters are highly carbonated, the system from the well to the storage tanks must be entirely closed and the water conducted through the distributing lines to the baths with the least possible agitation to prevent dislodging the gas. The water should be brought into the tub at or near the bottom through a fixture so designed that smooth flow and even distribution are accomplished.

B. *Metals Used for Storage and Distributing Systems.*—Special attention must be given to the type of metal used for the tubing of wells, tanks used for storage and the distributing lines. Waters that are alkaline in nature and are free from excess of carbon dioxide or hydrogen sulfide can be handled most economically by using a good grade wrought or cast iron pipe, with steel pressure tanks that may or may not be coated on the interior with a protective plastic or rubber base paint.

Mineral waters containing large excesses of carbon dioxide or hydrogen sulfide are the most difficult to store and distribute. They are always very corrosive toward metals, particularly iron or steel, and, wherever these metals are used, means must be taken to use protective coatings or to establish a chemical protection, the nature of which can be determined only through chemical study of the water. The basis of such treatment is the precipitation of an insoluble substance on the metal.

Pure copper and some of the copper alloys are the best metals to be used with the carbonated saline waters, in conjunction with steel pressure tanks that are either glass lined or protected with a suitable acid resistant paint. For conducting carbonated waters that are to be used internally, red brass pipe that has been tin coated is the most satisfactory equipment. Most mineral waters of the carbonated type have a very drastic initial action on pure copper, but after a short time a coating is formed on the metal that protects it from further attack.

Sulfur waters can be handled in copper alloy pipe or in wooden stave pipe. Iron pipe lasts but a short time with these waters.

Bath tub fixtures should be made, wherever possible, of cast stainless steel. Nickel and chromium plated fixtures do not withstand the action of most mineral waters. They are affected by salt waters, alkaline waters, sulfur and carbonated waters.

C. *Heating of Mineral Waters.*—The heating of mineral waters is probably the most bothersome and expensive problem associated with spa operation. This problem is encountered in all types of waters except those that issue from the ground in the form of hot springs.

Waters that are brines containing as their main constituents sodium chloride or soluble salts of magnesium and calcium can be heated to sufficiently high temperatures for the baths in the ordinary heating equipment designed for fresh water with minimum difficulties caused by scaling or corrosion.

Waters containing large volumes of carbon dioxide gas along with the bicarbonates of the alkaline earths are the most difficult to handle. On heating carbonated waters large volumes of carbon dioxide gas are liberated and salts of lime, magnesia and iron are simultaneously precipitated, coating tanks, pipe lines and fixtures with hard scale that reduces to a minimum the efficiency of heating units and in a very short time renders all small lines useless.

Much study has been given to the heating of these waters both here and abroad. In many places in Europe the water is heated to the required bathing temperature directly in the tub by a small radiator through which high temperature steam is passed. The radiator itself is supported on a swing joint so that when not in use as a bath heater it is swung up on the wall, where it may either be turned off or used as a room heater. This method produces a fine bath with high carbonation but has two very objectionable features: First, large volumes of carbon dioxide are liberated in the room where the patient is to be treated and the atmosphere becomes very dense with the gas, making breathing difficult. Second, the heater itself after short usage becomes coated with scale that chips off when the steam is turned on for a succeeding bath. This is usually very objectionable to the patient. Instantaneous type of heating of the water as it enters the tub has been tried, but without success. The gas is liberated from the water so rapidly that the finished bath is absolutely flat.

At Saratoga Spa a special pressure heating system has been designed and in use many years with highly satisfactory results. The heater tanks are kept under constant pressure and are designed so that the free gas forms a cushion at the top of the tanks. Heat is applied through a copper steam coil in the bottom of the tank and the temperature is thermostatically controlled at 135 to 140 F. It has been found that at higher temperatures excessive precipitation occurs and the iron in the water oxidizes very rapidly when the water is drawn in the tub. As the heating proceeds, some carbon dioxide is liberated and the excess pressure produced thereby is relieved through an automatic valve on top of the tank. The carbon dioxide thus bled off is trapped into a sewer line. The hot water, saturated with carbon dioxide, is drawn directly into the bath tub and the preparation of the bath completed by adding cold, highly carbonated water directly from storage.

The scale formed in heating is trapped in the tank, where it can easily be removed. The atmosphere of the bath room is nearly normal because of the elimination of the large volume of carbon dioxide gas at the heater tank.

D. *Boiler and Pumping Plant.*—A central boiler plant is desirable in all spas where the patronage is large. The source of heat may be derived from oil, coal or gas, depending on which is most economical. Wherever possible, oil or gas should be given first consideration because of the ease of automatic control, the absence of ash and smoke nuisance, and the lower maintenance cost. If coal or coke is used, automatic stoking should be installed.

The boiler plant should be of much larger capacity than the usual plant where there is a steady steam load. Unusual and sudden steam demands are the rule at most spas at certain hours of the day, and this demand must be met by providing liberal boiler capacity and steam reserve.

The spa buildings should be grouped conveniently around the boiler plant and connected with it by subways for carrying both steam and water lines, thus affording easy access for repairs.

Pumping equipment, whether steam or electric, should be long stroke and slow moving so as to reduce the agitation of water to a minimum.

E. *Laundry Facilities.*—The linen demand for spa work is large, from four to eight pieces being required for each treatment. Since it is not always possible to provide adequate linen through an outside service, provision for a laundry building should be given thoughtful consideration. Such a building should be located near the boiler plant for easy steam supply and requires the installation of washers, air driers, centrifugal driers, ironers, necessary baskets and tables, and small trucks for collecting and delivering linen. Adequate space should be provided for the storage of linen and the various chemical supplies needed for operation.

F. *Bath House Fixtures and Equipment.*—Most spas provide, in addition to mineral water baths, adjunct treatments including mineral packs, mud packs, various types of douches and sprays, hot rooms, steam rooms and water rubs. The materials and design of equipment must be chosen with the same care as other mechanical equipment.

1. *Bath Tubs.*—Bath tubs should be large enough to immerse a patient completely in a relaxed position. Usually the tub should be about 6 feet long by 24 inches deep by 24 inches wide, to meet this condition. These dimensions provide a tub that is suitable for the taller patients. A foot rest made of stainless steel or some resistant metal, provided with a base and four rubber suction cups, can be placed anywhere on the bottom of the tub by the attendant to suit the comfort of the shorter patient.

Tubs made of porcelain or iron coated with acid resistant enamel are most suitable. Other materials used for tubs include native mineral rock, wood, slate or concrete. Sometimes concrete is covered with a metal sheeting such as copper or aluminum. The latter has been used with sulfur waters.

2. *Packs.*—Hot packs may be given either with mineral water or with fresh water. If fresh water is used, the autoclave type of pack heater is most convenient. The pack material is placed on shelves in the autoclave and steam is kept flowing through, so that the packs become wet and heated to the proper temperature.

If the packs are to be prepared from mineral water, a hot pack sink must be provided. This sink should be of porcelain or slate, so that it may be easily cleaned with acid. Hot mineral water is piped to it and a suitable wringer attached for wringing the packs.

Mud packs require much special equipment. There should be rooms with suitable couches on which the patient reclines during the application of the packs. These rooms must be provided with either a tub or a shower to cleanse the patient after the application of the packs. Resting facilities must also be provided. The equipment for grinding, mixing and heating the mud should be installed in a separate room. Flowing steam is passed through the outside jacket, and either hand or motor operated paddles revolve to bring the mud to a uniform temperature. Grinding equipment is similar to that used for paint grinding and can be obtained from the same manufacturers.

3. *Hydrotherapy.*—In considering the technical features of the hydrotherapy department, the hot rooms should be large enough to accommodate several people reclining in chairs of the steamer type, covered with a sheet to protect the patient from burns. The source of heat can be steam radiation provided in the room itself or circulated conditioned air from a conditioning plant. Whatever the source of heat may be, when moisture is provided much lower temperatures can be used. The usual temperatures are between 140 and 160 F., depending on the amount of humidity present.

Steam rooms are usually small and are entirely of tile with a domed ceiling to prevent hot condensed water from dropping on the patient. The steam is introduced into the room through atomizing nozzles so as to produce a fog. Marble slabs are provided for the patient to sit or lie on during treatment.

Both hot and steam rooms should have windows so that the attendant can watch the patient.

Rubbing tables are constructed of marble on which sponge rubber mats are placed. Directly over the rubbing table a series of sprays are suspended which are controlled by a mixing valve. These sprays are used following the salt or soap rub or may be used on the patient while the attendant administers massage.

The douche equipment is located in a shower stall the walls of which are usually constructed of slate, marble or tile. The floor should be of tile and preferably of the nonslip type to avoid accidents.

At the extreme end of the stall a shower equipment is placed. This shower is provided with a rain douche applied from overhead, and needle sprays that impinge on the patient from four directions, covering every part of the body but the face. The temperature and pressure of the water are controlled by an attendant through a douche control table placed at the opposite end of the stall. This table is also equipped to administer the "Scotch," jet and fan douches.

III. METHODS OF CLEANING AND SANITATION

Particular attention must be given to keeping any bathing or hydrotherapy department scrupulously clean and sanitary.

To carry out such a program the rooms, floors, walls and equipment should be constructed of materials such as tile, marble or porcelain that lend themselves to easy cleaning and sterilization.

All equipment that is used in conjunction with sulfur water or waters containing iron should be of a material that will stand the action of acids. It is often necessary to remove the stains produced with an abrasive powder containing acid, or a dilute liquid acid to ensure proper appearance.

Floors in the bath rooms and hydrotherapy rooms should be cleaned with water containing some efficient antiseptic such as the chlorinated compounds. It is not practical in most bath houses to use foot baths, as the patient must go from one treatment room to another. The floors themselves, therefore, must be thoroughly cleaned and disinfected each day.

Council on Medical Service and Public Relations

THE COUNCIL HAS AUTHORIZED THE PUBLICATION OF THE FOLLOWING STATEMENT. J. W. HOLLOWAY JR., Acting Secretary.

THE WAGNER-MURRAY-DINGELL BILL

The legislation introduced in the United States Senate, June 3, 1943 by Senator Wagner and Senator Murray as S. 1161 and in the House of Representatives by Congressman Dingell as H. R. 2861 proposes radical amendments to the Social Security Act. Others have characterized it as "fantastic in scope, idealistic in objective and extremely expensive in its economic aspect."

The Council reserves judgment on the amendments proposed that are not directly concerned with medical care. Concern must be expressed, however, over the effect on the health of the people of that part of the legislation that undertakes to create a federally controlled system of compulsory sickness insurance to include an estimated 110,000,000 wage earners, self-employed persons and the dependents of both classes. Such a system would be created by section 11, which proposes to amend title IX of the Social Security Act to provide "Federal Medical, Hospitalization, and Related Benefits."

By a revolutionary process, the enactment of section 11 would undermine and destroy the American system of medicine that has developed in an evolutionary, healthful manner over the entire period of the history of medicine in the United States.

American medicine has developed an unexcelled quality of medical education. The enactment of section 11 would break down our system of medical education. It would remove the incentive that stimulates the student to acquire the best medical education obtainable by offering that student a regimented practice, federally supervised and controlled. This result the sponsors of the legislation inferentially apprehend by including a provision for federal grants-in-aid to stimulate medical education.

American medicine has made available to the people an unexcelled quality of medical care. The enactment of section 11 would attenuate the quality of medical care available to the people by imposing on physicians conditions of practice under which good medical care could not possibly be rendered. Medical practice would deteriorate from a highly personalized professional service to an impersonal, regimented service.

American medicine has produced unexcelled medical research by individuals. The enactment of section 11 would lessen the incentive for individual medical research by making it impossible for the results of that research to be utilized to their fullest extent. This result the sponsors of the legislation inferentially apprehend by providing for federal grants to *nonprofit institutions and agencies* to encourage and promote research.

American medicine has been responsible for a state of health of the people unexcelled in any other country. The enactment of section 11 would result in a deterioration of the health of the people, for if medical education suffers, if the quality of medical care available to the people becomes attenuated, if the incentive to individual medical research is removed, the resulting harmful effect on the health of the people will be inescapable.

WHAT DOES SECTION 11 PROPOSE?

Section 11 proposes to amend title IX of the Social Security Act to provide general medical, special medical, laboratory and hospitalization benefits to every person currently insured under the act, to the wives and children of such persons and to certain other groups who may voluntarily bring themselves within the coverage of the act.

To provide these benefits, the Surgeon General of the United States Public Health Service would be authorized to make all necessary arrangements. He would, in effect, become the autocrat of American medicine. Although every physician legally qualified by a state may, if he consents to regimentation, participate in this compulsory health insurance scheme, the Surgeon General may by regulation prescribe the conditions of participation. He too would be authorized to determine what compensation the participating physicians may receive and would have the final say as to the manner in which they will be compensated, whether on the basis of fees for services rendered, on a per capita basis, on a salary basis or on any combination or modification of these bases. He would be authorized to limit the number of insured persons a particular physician may treat. He would be authorized to determine what constitutes the services of a specialist.

Ostensibly to assist the Surgeon General there will be created a National Advisory Medical and Hospital Council to be appointed by the Surgeon General, of which he will himself be chairman. This council will have no authority; it will be authorized only to "advise." While an insured individual may select, normally, from the list of participating general practitioners the physician to treat him, he will be denied that privilege if the physician's quota of patients, as established by the Surgeon General, is already filled. If he is in need of the services of a specialist, he will have no voice in the selection of that specialist. The Surgeon General may arbitrarily assign an insured person to a particular physician if such person does not make his own selection.

The bill provides that in each area the provision of general medical benefit for all insured persons shall be a "collective responsibility of all qualified general practitioners in the area who have undertaken to furnish such benefit." The significance of this provision is difficult to determine. It may signify that each participating physician will be responsible for the quality of medical service rendered by every other participating physician in that particular area.

The Surgeon General would be authorized to determine what hospitals may participate in the scheme. Hospital benefits will range from $3 to $6 for each day of hospitalization, not in excess of thirty days, as determined by the Surgeon General with the approval of the Social Security Board. The rates will range from $1.50 to $4 for each day of hospitalization over thirty but not exceeding ninety. If the insured is placed in an institution for the care of the "chronic sick" the rate will range from $1.50 to $3 a day. Instead of making such payments to the insured individual, the Surgeon General, subject to the approval of the Social Security Board, may make contracts with participating hospitals for the payment of the reasonable cost of hospital service at rates neither less than the minimum nor more than the maximum rates specified, such payment to be full reimbursement for the cost of essential hospital services, including the use of ward or other least expensive facilities compatible with the proper care of the patient.

Insured persons will also be entitled to certain laboratory and other benefits, the nature and extent of which will be determined by the Surgeon General but which will include chemical, bacteriologic, pathologic, diagnostic and therapeutic x-ray and related laboratory services, physical therapy, special appliances prescribed by physicians, and eye glasses prescribed by a physician or other legally qualified practitioner.

TAXES TO PROVIDE BENEFITS

To finance the provisions of this bill, each included employer will be taxed annually at the rate of 6 per cent of his payroll, excluding all remuneration paid to an employee in excess of $3,000 a year, and each insured employee will be taxed 6 per cent annually of the wages received up to $3,000. Self-employed persons will be required to pay 7 per cent of the market value of their services annually up to $3,000. States and political subdivisions and their employees will be taxed at the rate of 3.5 per cent up to $3,000 if such governmental units voluntarily, by compacts, come within the coverage of the Social Security Act.

V 1
194

Of this total tax a certain amount will be credited to a "Medical Care and Hospitalization Account," an amount estimated as in excess of $3,000,000,000 annually.

GRANTS-IN-AID

Section 12 of the bill, as previously indicated, provides grants-in-aid as a stimulus for medical education, research and for the prevention of disease and disability, in apparent recognition that the enactment of the bill will require such a stimulus. The Surgeon General of the Public Health Service will determine who will be the recipients of such grants and the specific amounts that will be granted. He will determine too whether a particular project is worthy of stimulation.

The enactment of this bill will destroy the private practice of medicine. It will create a political system of medicine dictated by a federal bureaucracy. It will lower the high health level of the people of the United States. Its enactment should be vigorously opposed.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

ROCKE HYDROTHERAPY FOOT AND ARM BATH ACCEPTABLE

Manufacturer: William Rocke, 2605 Noyes Street, Evanston, Ill.

The Rocke Hydrotherapy Foot and Arm Bath is a device for the application of hot, whirling, aerated water (with a vibratory action) to the feet and arms. The apparatus consists of a tank 17 inches in diameter which is mounted on a base 34 inches in height, containing a one-fourth horsepower motor. Incorporated in the tank are a circulator unit, foot plate and air intake.

Eighteen gage steel with three coats of porcelain enamel is used in the construction of the tank. According to the manufacturer this material is used because it can be more easily obtained during the present emergency. The tank is protected on the outside by a steel skirt extending from the base to the top. The inside of the tank is white and the outside is gray. The circulator unit is constructed of die cast aluminum with self-oiling bronze bearings and is direct motor driven. The foot plate and air intake cover are of chrome or cadmium plated steel. A rubber tube with aluminum control valve comprises the air intake. The motor is rubber mounted with three conductor rubber covered cord and is fully grounded.

Rocke Hydrotherapy Foot and Arm Bath.

The steel tank with three coats of porcelain enamel, together with the steel skirt jacketing the tank, is said to tend to slower cooling of the liquid. The temperature of the liquid while in operation normally drops about 2 degrees in thirty minutes; temperature change also depends on room temperature. An immersion hot water heater is available.

The apparatus was investigated clinically by the Council in the physical therapy department of a large hospital. In this investigation the device was found to satisfy the claims made for it by the manufacturer.

The Council on Physical Therapy voted to accept the Rocke Hydrotherapy Foot and Arm Bath for inclusion in its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

CHORIONIC GONADOTROPIN (See New and Nonofficial Remedies, 1943, p. 427).

The following dosage forms have been accepted:

WINTHROP CHEMICAL CO., INC., NEW YORK

Vials Korotrin 100 International Units: 2 cc. A powdered preparation of chorionic gonadotropin admixed with sucrose which, when diluted with the accompanying 2 cc. of sterile distilled water containing 0.2 per cent of metacresol, provides a solution having a potency of 50 international units per cubic centimeter. Marketed in boxes of 5 ampuls and 25 ampuls with diluent for each ampul.

Vials Korotrin 500 International Units: 2 cc. A powdered preparation of chorionic gonadotropin admixed with sucrose which, when diluted with the accompanying 2 cc. of sterile distilled water containing 0.2 per cent of metacresol, provides a solution having a potency of 250 international units per cubic centimeter. Marketed in boxes of 5 ampuls and 25 ampuls with diluent for each ampul.

Vials Korotrin 1,000 International Units: 10 cc. A powdered preparation of chorionic gonadotropin admixed with sucrose which, when diluted with the accompanying 10 cc. of sterile distilled water containing 0.2 per cent of metacresol, provides a solution having a potency of 100 international units per cubic centimeter. Marketed in packages containing 1 or 10 vials with 1 or 10 bottles of diluent.

Vials Korotrin 5,000 International Units: 10 cc. A powdered preparation of chorionic gonadotropin admixed with sucrose which, when diluted with the accompanying 50 cc. of sterile distilled water containing 0.2 per cent of metacresol, provides a solution having a potency of 100 or 500 international units per cubic centimeter. Marketed in packages containing 1 or 10 vials with 1 or 10 bottles of diluent.

DIETHYLSTILBESTROL (See New and Nonofficial Remedies, 1943, p. 403).

The following dosage forms have been accepted:

THE WARREN-TEED PRODUCTS CO., COLUMBUS, OHIO

Tablets Diethylstilbestrol: 0.5 mg. and 1 mg.

Sterilized Solution Diethylstilbestrol (in sesame oil) 1 mg. per cc.: 15 cc. containing 0.5 per cent chlorobutanol.

Ampuls Sterilized Solution Diethylstilbestrol (in sesame oil) 1 mg. per cc.: 1 cc.

DIGITALIS (See New and Nonofficial Remedies, 1943, p. 289).

The following dosage forms have been accepted:

BURROUGHS WELLCOME & CO., INC., NEW YORK

Tabloid Digitalis Leaf: .32 mg., .65 mg. and 97 mg.

THE UPJOHN COMPANY, KALAMAZOO, MICH.

Ampoule Sterile Solution Digitalis Injection: 2 cc. and 10 cc. Each cubic centimeter contains ⅓ U. S. P. XII digitalis unit and alcohol 10 per cent as preservative and stabilizer in sterile phosphate buffered solution.

SODIUM MORRHUATE (See New and Nonofficial Remedies, 1943, p. 310).

The following dosage form has been accepted:

CHEPLIN BIOLOGICAL LABORATORIES, INC., SYRACUSE, N. Y.

Ampoule Solution Sodium Morrhuate 5% W/V with Tricresol 0.3%: 2 cc. and 5 cc. ampoules and 30 cc. vials. Each cubic centimeter contains sodium morrhuate ¼ grain; tricresol 0.3% (W/V) as a preservative; double distilled water q. s.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street - - Chicago 10, Ill.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, NOVEMBER 13, 1943

HYPERTENSION IN MILITARY SERVICE

Some persons, when exposed to the emotional stress of a physical examination, have a temporary rise in blood pressure which subsides in later readings. Little significance is given to such a transient elevation in blood pressure. Physicians assume that, if one or more readings of blood pressure within the normal range are obtained, the possibility of hypertensive disease can be disregarded. However, due consideration should be given to the fact that in many hypertensive persons the level of blood pressure is variable. Wide fluctuations from normal to high levels may occur in intervals of a few hours, and elevations of blood pressure are readily precipitated by emotional strains. These cases apparently tend to develop ultimately into permanent hypertension. In 1,522 patients reviewed by Hines [1] ten to twenty years after the original examination, a high percentage of those presenting excessive variability of the normal blood pressure developed definite hypertensive disease. Master [2] reexamined a group of 50 persons who one to seven years previously had shown labile high blood pressure with fluctuations which included normal values. He found that 76 per cent presented definite permanent hypertensive levels. Rühl [3] as early as 1927 had interpreted the labile hypertension as the early stage of essential hypertension. There is no clear-cut line of delimitation between the normal person who shows occasionally an increase in blood pressure under various influences and the borderline hypertensive patient. Essentially the two represent different degrees of the same condition.

As would be expected in the light of these observations, the rules established by the Navy for acceptance and rejection of candidates have resulted in the acceptance for active duties of borderline hypertensive patients. A number of instances in which this condition has led to the development of clinical symptoms and unfitness during active campaign is reported by Master.[4] The ideal solution would be to reject all persons presenting hypertensive levels at any one reading. However, when statistical figures are considered the incidence of hypertension in the general population would be so high as to prevent the attainment of the minimum goal required by the armed forces.

Considering the implications of this difficult problem, Master suggests that a different approach be adopted. The question of fitness for active duties in the borderline cases is not so much dependent on the height and variability of the blood pressure as on the absence or presence of complications of hypertension. An uncomplicated mild hypertension is compatible with a high degree of physical activity and need not be a cause for rejection. A complete cardiovascular examination, including a roentgenogram of the chest, electrocardiograms before and after exercise tests, examination of the retinal vessels and renal function tests, is necessary in order to determine the presence of cardiac enlargement, myocardial damage, coronary disease, arteriolar lesions and renal insufficiency. On these criteria and not on blood pressure measurements alone should the physician base his judgment as to the suitability of candidates for military service.

1. Hines, E. A., Jr.: Range of Normal Blood Pressure and Subsequent Development of Hypertension: A Follow-Up of 1,522 Patients, J. A. M. A. **115**:271 (July 27) 1940.
2. Master, A. M.: Borderline Hypertension and the Navy During the Emergency: Incidence of Hypertension Among the General Population, U. S. Nav. M. Bull. **41**:52 (Jan.) 1943.
3. Rühl, A.: Wie weit ist der genuine arterielle Hochdruk anatomisch bedingt? Deutsches Arch. f. klin. Med. **156**:129, 1927.
4. Master, A. M.: Cardiovascular Problems in the War: Hypertension and the Navy, Bull. New York Acad. Med. **19**:704 (Oct.) 1943.

CARCINOGENIC TRANSFORMATION OF FIBROBLASTS IN CULTURE FLASKS

Earle and Voegtlin [1] of the National Cancer Institute have demonstrated that rat and mouse fibroblasts grown outside the body in a medium containing methylcholanthrene, a carcinogenic chemical, are changed into cells which resemble the cells in cultures of sarcoma induced by the injection of methylcholanthrene into the subcutaneous tissue of rats. This transformation appeared to be irreversible. Now Earle [2] reports that sarcoma can be produced by the injection of fibroblasts subjected to the action of methylcholanthrene in culture flasks. When mouse fibroblasts had been cultured in a medium of horse serum, extract of chick embryo and salt solution for 291 days, purified methylcholanthrene was added to the cultures in the proportion of 1 microgram to each cubic centimeter of culture fluid. The cultures were then carried on for different periods, 6, 32, 111, 184 and 406 days, at the end of which they were continued without methylcholanthrene for various periods. The first apparent effect of the carcinogen was

1. Earle, W. R., and Voegtlin, Carl: The Mode of Action of Methylcholanthrene on Cultures of Normal Tissues, Am. J. Cancer **24**:373 (Nov.) 1938; A Further Study of the Mode of Action of Methylcholanthrene on Normal Tissue Cultures, Pub. Health Rep. **55**:303 (Feb. 23) 1940.
2. Earle, W. R.: Changes Induced in a Strain of Fibroblasts from a Strain C3H Mouse by the Action of 20-Methylcholanthrene (Preliminary Report), J. Nat. Cancer Inst. **3**:555 (June) 1943.

to slow down the rate of the increase in the size of the cell clumps. Later the cells were changed in shape and became increasingly coherent laterally, forming ribbons and sheets. These changes in the cells continued in successive cultures after the addition of methylcholanthrene to the culture fluid was discontinued. Two cell strains subjected to the carcinogen for 6 and 32 days respectively have been carried on in carcinogen free cultures for about a year without any loss of the induced characteristics. Some months after morphologic changes were noted in the carcinogen cultures, control cultures began to present similar changes. Whether this change in the control cultures was due to the accidental introduction of traces of methylcholanthrene or not will be considered in a later report. "It is thought likely that such trace contamination did occur," but it must have been extremely slight in view of all the precautions against contamination.

On injection into mice (strain C3H) of carcinogen treated cultures of mouse fibroblasts at varied intervals after the withdrawal of the carcinogen, sarcomatous tumors arose at the sites of injections, often as early as 9 days after the injection, and caused death within a few weeks, with or without metastasis. Such tumors were subinoculated successfully. Injections of control cultures with altered cells gave similar results. Nettleship [3] describes the characteristics of the neoplasms which grew from the inoculation of altered fibroblast cultures. The structure was similar to that of the various forms of spindle cell sarcoma in man. Earle and Nettleship both point out that short exposure of cultured fibroblasts to the carcinogen produced cells of a comparatively low neoplastic activity and slightly changed in structure. No metastasis occurred from tumors from these cells. On somewhat longer exposure the cells became more greatly altered morphologically and there was an increased invasiveness into the surrounding tissues. A number of tumors showed metastases. On still longer exposure of the cells to the carcinogen the cell structure of the tumors arising from them was even more greatly changed; the invasiveness was at least as great, but fewer metastases occurred.

The tumors described arose by the multiplication of implanted cells which came from cultures carried on for many months after exposure to methylcholanthrene. It is not likely that the cells carried over any of the carcinogen to which their remote ancestors were exposed. The implanted cells were cancerous, that is, sarcomatous, cells which multiplied as such on implantation in living mice. After the change from normal fibroblasts under carcinogenic influences, all subsequent generations were cancerous in greater or lesser degree. This change remained irreversible. While it is not difficult to make normal cells and their descendants cancerous either in vivo or in vitro, it is not yet known how cancerous cells can be made normal again; that is, no doubt the secret of cancer. The results of the remarkable experiments briefly recounted suggest ways and means for direct attacks on the problems of the irreversibility of the cancer cell.

3. Nettleship, Anderson: Morphology of Sarcomas Derived from Fibroblasts Previously Treated with 20-Methylcholanthrene in Vitro (Preliminary Report), J. Nat. Cancer Inst. 3: 559 (June) 1943.

Current Comment

EPINEPHRINE-LIKE SUBSTANCES IN THE HEART MUSCLE AND SUDDEN DEATH

The cause of unexpected, sudden death can be determined only by thorough postmortem examination the results of which are interpreted in the light of the history of the victim and of the circumstances under which he died. In many such cases chemical methods may be of great value. In an athletic student aged 21 who was found dead in bed the only abnormality discovered by Raab [1] was an excessive amount of epinephrine-like substances or catechols in the heart muscle. Death was not caused by structural changes, by laryngeal obstruction or by poisoning as commonly understood. Raab argues that the death was due to excess of epinephrine-like substances on the basis of the following general considerations: In rats cardiac death takes place when the concentration of such substances in the myocardium exceeds a certain limit; in a series of patients who died from cardiac failure, particularly in cases of hypertension, angina pectoris, uremia and adrenal tumor, he found in the majority an abnormally high accumulation of epinephrine or of epinephrine-like catechols in the heart muscle and, finally, experimental production of fatal heart failure by means of epinephrine and related amines. Raab points out that in human beings, as well as in animals, "severe cardiac episodes and death" have followed the injection of epinephrine hydrochloride; also that ventricular fibrillation, which is regarded as a common cause of sudden cardiac death, may be produced by epinephrine. He notes too the not infrequent reports of rapid death of patients with adrenal tumor, with hemorrhagic necrosis and other lesions of the adrenals. This group, by the way, appears to include cases of death from adrenal insufficiency as well as cases of hyperepinephrinemia. The concentration of epinephrine-like catechols in the heart muscle of the athletic student examined by Raab was not only above the physiologic maximum but the highest in a series of 54 human hearts, normal and abnormal. According to Raab "the most famous case of sudden death of an apparently healthy athlete from 'exhaustion' occurred two thousand four hundred and thirty-three years ago when the marathon runner collapsed, dead, on his arrival in Athens, after having shouted the message of victory over the Persians. It appears most probable from present knowledge that his heart succumbed to ventricular fibrillation due to an acute excessive accumulation of sympathomimetic amines in the myocardium." No doubt the chemical examination of the heart muscle will prove helpful in explaining the nature of sudden deaths, particularly in the case of athletes, but eventually in other cases as well.

1. Raab, Wilhelm: Sudden Death of a Young Athlete with an Excessive Concentration of Epinephrine-like Substances in the Heart Muscle, Arch. Path. 36: 388 (Oct.) 1943.

DOCTORS AT WAR TO BE RESUMED

Arrangements have been completed with the National Broadcasting Company to resume the series of broadcasts entitled Doctors at War. This will be the fourth series of broadcasts under the general title of Doctors at Work and will be the ninth annual series of dramatized health programs presented cooperatively by the American Medical Association and the National Broadcasting Company. Owing to radio commitments in connection with the war, the opening of the series has been postponed until January 8. Broadcasts will be given on Saturday afternoons at 5 o'clock Eastern War Time (4 o'clock Central, 3 o'clock Mountain, 2 o'clock Pacific War Time). The series will run for twenty-six weeks. The Medical Department of the United States Army and the Bureau of Medicine and Surgery of the United States Navy have agreed to permit doctors in the armed forces to participate in the programs. The medical departments of both the Army and the Navy will assist in the technical preparations for the broadcasts.

DEVELOPMENT OF RESISTANT PNEUMOCOCCI DURING SULFONAMIDE TREATMENT

Experimental evidence that the capacity to acquire resistance to sulfonamide drugs occurs in vivo was offered by MacLean and his associates [1] in 1939. Pneumococci of infected mice treated with sulfapyridine establish an increasing tolerance to the drug. Lowell, Strauss and Finland [2] in 1940 demonstrated the development of resistance in pneumococci obtained from patients treated with sulfonamide drugs. Sulfonamide sensitive organisms were isolated in 2 cases of pneumonia prior to treatment. After several days of drug therapy and again during a relapse of the pulmonary infection, pneumococci of the same type were isolated and found to be sulfonamide resistant. Recently Hamburger and his colleagues [3] studied sulfonamide sensitivity of pneumococci isolated from a great number of patients both before and after sulfonamide therapy. In none of 168 patients were strains of pneumococci isolated before treatment significantly resistant to the drug. The organisms obtained during or after treatment were definitely more resistant than those obtained before treatment in only 4 of 72 cases treated for less than three weeks. In each of 3 cases treated for long periods (forty-seven days or more) resistant pneumococci developed during treatment. This suggests that sulfonamide resistant organisms may be produced regularly during the clinical use of these drugs. Lesions such as occur in unresolved pneumonia, in which the complete eradication of the bacteria requires prolonged and increased concentration of sulfonamides, and in endocarditis, in which bacteria have only limited exposure to the drugs, offer the ideal conditions for the development of drug fastness. As pointed out by Hamburger and his associates, even though the development of sulfonamide resistant organisms occurs in a relatively small number of cases, this result may constitute a serious hazard in the future.

1. MacLean, I. H.; Rogers, K. B., and Fleming, Alexander: M. & B. 693 and Pneumococci, Lancet 1:562 (March 11) 1939.
2. Lowell, F. C.; Strauss, Elias, and Finland, Maxwell: Observations on the Susceptibility of Pneumococci to Sulfapyridine, Sulfathiazole and Sulfamethylthiazole, Ann. Int. Med. 14:1001 (Dec.) 1940.
3. Hamburger, J. M.; Schmidt, L. H.; Sesler, C. L.; Ruegsegger, J. M., and Grupen, E. S.: The Occurrence of Sulfonamide Resistant Pneumococci in Clinical Practice. J. Infect. Dis. 73:121 (July-Aug.) 1943.

THE SURVIVAL TIME OF HUMAN SPERMATOZOA

One of the serious obstacles to the scientific evaluation of chemical contraceptives has been the absence heretofore of any uniform method of determining the survival time of human spermatozoa. Brown and Gamble,[1] in a series of communications, report the satisfactory use of potassium acid phthalate as a spermicidal agent. This agent is prepared as a watery solution with a known acidity of p_H 4.0. A 2.8 per cent solution mixed with an equal quantity of semen has been found to give spermicidal times of convenient length. When the spermicidal times are measured at ordinary room temperature the results are arbitrarily referred to as the "phthalate time." Variations in temperature exert a considerable effect on the phthalate time: at body temperature the relative spermicidal times vary significantly from those at room temperature. Variations in phthalate time of different semen specimens have been also found large. Nevertheless this method appears to permit evaluation of the relative spermicidal activities of commercial contraceptives, and a number of such preparations have already been tested by this means. Although this apparently represents a definite addition to scientific method, the several variables attached to the procedure indicate that the conclusions must be cautiously accepted and further careful studies at control attempted.

1. Brown, Royal L., and Gamble, Clarence J.: Factors Influencing the Survival Time of Human Spermatozoa in a Solution of Potassium Acid Phthalate, Human Fertil. 8:4 (March) 1943; Studies of Spermicidal Times of Contraceptive Materials, ibid., p. 9.

IMMEDIATE TREATMENT OF WOUNDS AND BURNS

Elsewhere in this issue (page 675) appears an article on the immediate treatment of wounds and burns based on military experience. This work will have far reaching effects on first aid in civilian as well as military life. Many lives can be saved, Gallagher claims, by the early utilization of simple sterile compression dressings to be applied to severe burns or other large surface wounds immediately at or near the scene of injury. The technic is simple and can be employed as a first aid measure by relatively untrained persons. Compression dressings may become standard equipment for all first aid kits. The proper application of these dressings should be made familiar to the police in squad cars, nurses' aides, street car and bus motormen and conductors, firemen, workers in industry and many others.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

EARLY RECOGNITION AND TREATMENT OF NEUROPSYCHIATRIC CONDITIONS IN THE COMBAT ZONE

The War Department, Washington, D. C., recently released Circular Letter No. 176, regarding the early recognition and treatment of neuropsychiatric conditions in the combat zone, which is as follows:

1. *General.*—Any medical officer may be called on to treat neuropsychiatric casualties. Because of the shortage of neuropsychiatrists, the burden of early recognition and treatment of these casualties will fall on medical officers without specialized training. The attention of all medical officers, therefore, is invited to their responsibility for the mental as well as physical health of military personnel.

2. *Incidence.*—According to present figures, from 10 to 20 per cent of casualties developing in combat are neuropsychiatric and, in certain engagements, as high as 30 per cent are of this type. It has been found that, when these cases are properly recognized and treated at forward areas, up to 80 per cent can be returned successfully to combat duty; whereas, when improperly evaluated and unnecessarily evacuated to rear areas, only from 5 to 10 per cent can be returned to duty.

3. *Etiology.*—a. Ordinarily neuropsychiatric disorders are thought to occur only in weaklings or in individuals with personality defects. This is not true. Information at hand indicates that a significant proportion of the neuropsychiatric casualties are occurring in individuals who give no history suggesting predisposition. Under the extremes of stress and fatigue of modern combat, the most stable individual may reach his breaking point. Thus, the presence of neuropsychiatric disorder must be looked for in normal as well as predisposed individuals.

b. Factors which precipitate psychiatric disorders are separation from home, regimentation, lack of freedom, lack of privacy, lack of feminine companionship, a feeling of not being appreciated and lack of confidence in leaders. In combat are added extreme fatigue, danger of death and mutilation, exposure to cold, heat, disease, isolation, confusion and hunger. The danger of being a coward, of losing self control, as well as responsibility for the lives of others, also plays a role. Insufficient understanding and conviction regarding the need to fight are also factors.

4. *Clinical Types and Diagnoses.*—a. Considerable confusion exists as the result of current use of diagnostic terms, such as "operational fatigue," "shell shock" and "war neurosis." There is no evidence that any new clinical entity has appeared in this war which would warrant the employment of these terms. It is directed that standard nomenclature for psychiatric disorders be utilized wherever possible.

b. In certain theaters it has been found that the term "psychoneurosis" produced in the patient's mind the idea of war causation and incurability and thus materially interfered with recovery. The term "exhaustion," on the other hand, implied to the patient nonspecific etiology, natural occurrence and speedy recovery. It was also in a measure true in that in the majority of cases this exhaustion was a strong contributory factor. If it is found expedient to use the term "exhaustion" as a preliminary diagnosis for combat neuropsychiatric casualties, the term should be employed only on the emergency medical tag (M. D. Form 52 *b*) and the case rediagnosed with the proper psychiatric term on the field medical record (M. D. Form 52 *c*). The use of the term "exhaustion" for psychoneurosis will be confined to cases developing under enemy action. Cases of exhaustion free from psychiatric components and essentially "physical" in nature will be qualified with an appropriate term in addition to the word "exhaustion" for purposes of differentiation.

c. Psychiatric casualties fall into the following main groups and should be so labeled:

(1) Psychoneuroses: These comprise the vast majority of neuropsychiatric casualties in the combat zone. They occur either in a normal or an emotionally unstable individual. Underlying domestic difficulties frequently play a role. The types of psychoneuroses encountered are as follows:

(a) Anxiety. The anxiety type is the most common. The anxiety symptoms show pronounced variations in severity, but certain symptoms are common to all of them. The most striking of these manifestations is the inappropriate reaction to any sudden sound, sudden movement or the sound of motors of any description. When these stimuli occur, the patient immediately concentrates all attention on the sound or, in more severe cases, may immediately run or seek cover of some sort and exhibit all the symptoms of a minor panic state. This reaction cannot be said to be abnormal qualitatively, since it is the normal reaction, to a lesser degree, of all men who have experienced combat conditions, but the quantitative response is clearly exaggerated. With this abnormal response there is usually a variable degree of mental confusion, tachycardia, tremors and, if severe, vasomotor reactions of the sympathetic type are evident. In addition, they manifest all of the anxiety reactions evident in civil life; namely, night terrors, insomnia, irritability, inabilty to concentrate, tremor and somatic symptoms of the visceral type.

(b) Hysteria. The hysterical reactions of paralysis, anesthesia, deafness, blindness and aphonia, so common in the last war, are notable for their rarity. Of the hysterical reactions seen, the rhythmic reflex tremors, repetitive dodging and avoiding movement, amnesias and stupor reactions are by far the most common. These manifestations are extremely dramatic in character and in general show a very poor response to therapy in that, when they are resolved, anxiety or other hysterical manifestations replace them or they recur under very minor stress. Some of these cases are distinguished from true psychotic reactions with great difficulty. They may show clearcut hallucinatory reactions, thought block, retardation, decidedly childish behavior and little insight.

(c) Psychasthenia, neurasthenia and reactive depression are seldom seen and when seen do not respond rapidly.

(2) Psychoses: Psychoses rarely occur in normal individuals but may be precipitated in unstable individuals by stress of battle. The clinical pictures do not differ from those seen in the zone of interior. When the manifestations are

bizarre and dramatic, or when hallucinations and delusions are present, detection is not difficult. Psychoses may also be manifested merely by overtalkativeness, overactivity, distractability, depression, apathy, indifference, carelessness in the care of clothes and eating habits or by undue suspiciousness or complexes on particular subjects, such as the government or religion. Psychoses also occur which appear to be full blown cases of schizophrenia but differ from the true disease by clearing up in a matter of days or weeks.

(3) Psychopathic Personality: Psychopathic personalities with homosexuality, emotional instability or asocial and amoral trends are, of course, revealed but not caused by the stress of battle. Individuals with these personality defects are more likely to become psychiatric casualties than are "normal" individuals.

(4) Mental Deficiency: Limited intelligence also is revealed rather than caused by combat and may be mistaken for hysterical confusion or stupor.

(5) Organic Neurologic Disease: Concussion Due to Blast. An individual may be within a few feet of a bursting shell and suffer no organic damage, whereas another individual many yards from the same burst may be killed outright by the concussion. The individual who has suffered organic damage from blast almost invariably gives a history of clear loss of consciousness, having his breath knocked out, coughing up bloody sputum or bleeding from the ears and nose. On examination he may show fissuring of the skin, flash burn, perforated or hemorrhagic eardrums, conjunctival hemorrhage, signs of intrathoracic or intra-abdominal pathologic changes, focal or general signs of organic damage of the central nervous system.

5. *Malingering.*—A common error is to mistake psychoneurosis for malingering. It is difficult for many to accept the fact that malingering and psychoneurosis are distinct clinical entities. Treatment effective for one is utterly useless and even harmful for the other. Malingering is the conscious, deliberate exaggeration or pretense of an illness for the purpose of escaping duty. Psychoneurosis is an actual illness. By definition, a malingerer lies about his symptoms. A person with psychoneurosis either tells the truth or what he firmly believes is the truth. It may be true that neither wants to return to duty, but the malingerer is aware that he could go back if he chose, whereas a person with psychoneurosis either is actually unable to return to duty or sincerely believes so.

6. *Disposition.*—a. It is highly important to avoid indiscriminate evacuation. If a case can be treated adequately in forward areas, the prognosis is, as a rule, far better. On the other hand, delay in evacuating cases for which specialized treatment in a base area is necessary may prove disastrous to the patient and harmful to the efficiency and morale of the unit.

b. The criterion for selection of cases is the length of time which will be necessary to return a given case to effective duty. In general, the evacuation policy is to retain at the level of the evacuation hospital only those who require five days' treatment or less. All other cases must be treated in hospitals further removed from the front. In a general way, the accompanying table, based on actual field experience, may serve as a guide.

7. *Treatment.*—a. Treatment of neuropsychiatric cases developing in the combat zone is based on four cardinal principles:

(1) Early selection of cases which with treatment may be returned promptly to duty.

(2) Treatment of these cases in the combat zone.

(3) The rapid initiation of sedation in all cases.

(4) Recognition that psychiatric casualties are not malingerers needing punishment but sick men needing treatment.

b. Treatment in the Division Area: Battalion or regimental medical officers can return many mild cases to duty in a few hours by means of discussion, reassurances and short rest periods in the unit rest area. Heavy sedation should be initiated when the patient is first seen. This heavy sedation acts to raise the stimulus threshold, decreases the anxiety reaction and decreases the abnormal suggestibility. The dose given must not be sufficiently high to convert a sitting case into a litter case. The sedation of choice is sodium amytal 6 to 9 grains (0.4 to 0.6 Gm.) orally or an equivalent dose of a similar rapidly acting sedative. Phenobarbital 4½ grains (0.3 Gm.) may be used, but the slowness of its action is a disadvantage in an acutely excited patient. Intravenous medication is to be avoided in forward areas because it converts a sitting into a litter patient and it is only rarely necessary. Morphine should not be used. If there is delay in the collecting or clearing station (and the patient cannot immediately be returned to duty), further sedation is given to keep him in a drowsy state. Doses of sodium amytal up to 15 grains (1 Gm.) or phenobarbital up to 8 grains (0.5 Gm.) in twenty-four hours may be given with safety.

c. Treatment at the Evacuation Hospital: Immediately on arrival, a rapid examination of the patient is made in order to classify him either for further evacuation on criteria previously discussed or retention in the hospital for treatment. Those retained should be sent to a separate neuropsychiatric ward, allowed to wash, have the ward rules explained to them and a more exhaustive history and physical examination given. On the basis of this more complete examination, those men with profound disturbances are evacuated the following day. Those remaining, whose prognosis seems good, are given explanations for their symptoms, strong reassurance and suggestions and are then sent to bed for two or three days. While in the ward they are given phenobarbital routinely and additional sodium amytal, if necessary, so that most of their time is spent sleeping. All patients are required to be up for each meal, which they get by standing in line with the up-patients, and to keep their own bed and immediate ward area in order. These steps are taken deliberately to maintain a sense of discipline and to discharge any idea of serious or physical illness. All therapeutic discussion is carried out in the open ward with the idea of repetitive mass treatment effect. Intravenous barbiturate catharsis and suggestions may be used in selected cases. Sedation is discontinued for a full day before discharge, and during this time the decision is made whether to return the patient for further duty or to evacuate him to the communication zone. This decision is based on numerous factors, but response to the direct questions "How do you feel now?" and "Do you want to return to your unit for duty?" are very often the deciding factors. There is no use in returning a man who boldly states that he is certain that he will have further trouble. Little attention is paid to new or minor symptoms, except to minimize them and give strong reassurance. No case should be kept in the evacuation hospital over five days.

Evacuation Policy for Psychiatric Cases

Retain	Evacuate Immediately	Doubtful
1. All psychoneuroses of the anxiety type except the most severe	1. All psychoses	1. Moderately severe psychoneuroses of hysteria type
2. Mild psychoneuroses of the hysteria type	2. All organic neurologic disorders	2. Minimal concussion due to blast
	3. All psychiatric repeaters	3. Mild psychopaths of criminal and aggressive types
	4. Psychoneuroses with visceral somatic symptoms	4. Moderate mental defectives
	5. All severe mental defectives	5. Mild reactive depressions
	6. All severe psychoneuroses of the hysteria type (stupors, amnesias, reflex tremors and tics)	
	7. Severe psychoneuroses of the anxiety type	
	8. Severe and moderate reactive depressions and psychasthenias	
	9. Definite psychopathic personality	
	10. Most cases of concussion due to blast	
	11. Severe mental defectives	

For the Surgeon General:

ROBERT J. CARPENTER,
Lieutenant Colonel, Medical Corps,
Executive Officer.

BOLLING FIELD BASE HOSPITAL

Until a few years ago Bolling Field, D. C., was served by a small dispensary station and was otherwise dependent on Walter Reed General Hospital for cases requiring hospitalization. Col. James F. Brooke, base surgeon and senior flight surgeon, who arrived at Bolling Field about five years ago and who is at present in command of the base hospital, deserves credit for his efforts which made possible the building of the new hospital. When the hospital was opened in May 1941 the main barracks, which had formerly housed the dispensary, was turned into the flight surgeon's office, where Lieut. Col. Bernard L. Jarman, chief of the flight surgeon's section, is now in charge. Among others on the hospital staff at present are Capt. Floyd Fortuin, psychiatrist; Capt. Spenser C. Flo, who is in charge of the surgical section; Capt. Floyd K. Hurt, x-ray specialist, who directs this department at the hospital, and Major Timothy F. Moran, chief of the eye, ear, nose and throat section.

ARMY SURGEON CITED BY NAVY

Capt. Beverly D. Hairfield, M. C., U. S. Army, formerly of Charlottesville, Va., received a special citation from the Navy for his work during the Sicilian invasion, having been detached from the evacuation hospital when he volunteered for the assignment. Dr. Hairfield graduated from Vanderbilt University School of Medicine, Nashville, in 1939. He entered the service July 1, 1942, when he was commissioned a first lieutenant, and was recently promoted to captain. Regularly assigned to an evacuation hospital which has been in North Africa, Dr. Hairfield has been in the surgical division. He landed in Casablanca in the invasion of North Africa and moved close behind the advancing lines to Bizerte and Tunis.

FLIGHT SURGEONS' ASSISTANTS

A class of ninety-six flight surgeons' assistants completed the course in aviation medicine at the School of Aviation Medicine, Randolph Field, Texas, October 9. Brig. Gen. Eugen G. Reinartz, U. S. Army, is commandant of the school.

ARMY PERSONALS

A letter from Capt. Charles H. Fleck, dated September 23, was recently received by the public safety director of Altoona, Pa., in which was enclosed a Jap souvenir, presumably a chart for temperature and pulse readings, 15 by 12 inches in size and of exceedingly fine, white paper, evidently made of rice. Dr. Fleck also stated that when his contingent took possession of an island after the Japs had fled they found that the enemy had left behind most of their possessions except their arms. They had dug caves and tunnels, and their medical and other stores were found intact by the allied soldiers. Dr. Fleck is in the medical corps and in service in General Douglas MacArthur's army in the south Pacific. He graduated from George Washington University School of Medicine, Washington, D. C., in 1932 and entered the service early in 1943.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their Procurement and Assignment Service quotas for Jan. 1, 1944.

1. Prospective interns who have not yet obtained a hospital appointment should communicate with these institutions either directly or through the office of the dean of their medical school. Assistant residents and residents should direct their applications to the hospital superintendent in the usual manner.

2. Institutions having a shortage of interns or residents are again invited to make their needs known to the Council on Medical Education and Hospitals. In reporting shortages, hospitals should indicate the number of interns, assistant residents and residents needed to complete their quotas for Jan. 1, 1944.

Hospitals Reporting Vacancies for Interns or Residents

ALABAMA

St. Vincent's Hospital, Birmingham. Capacity, 131; admissions, 3,687. Sister Mariana, R.N., Superintendent (mixed resident).
St. Margaret's Hospital, Montgomery. Capacity, 168; admissions, 4,990. Sister Roberta Degnan, R.N., administrator (mixed res.).

ARKANSAS

Leon N. Levi Memorial Hospital, Hot Springs. Capacity, 75; admissions, 845. Regina H. Kaplan, Administrator (mixed resident).

CALIFORNIA

Greens' Eye Hospital, San Francisco. Capacity, 35; admissions 1,063. Miss Marian I. Hamilton, Superintendent (resident ophthalmologist).
Mt. Zion Hospital, San Francisco. Capacity, 189; admissions, 4,866. Dr. J. A. Katsive, Medical Director (intern).
Shriners Hospital for Crippled Children, San Francisco. Capacity 60; admissions, 216. Mrs. Gertrude R. Folendorf, R.N., Superintendent (resident orthopedist).

CONNECTICUT

Bridgeport Hospital, Bridgeport. Capacity, 416; admissions, 10,744. Mr. Oliver H. Bartine, Superintendent (intern).
New Britain General Hospital, New Britain. Capacity, 265; admissions 6,826. Dr. H. Weston Benjamin, Managing Director (int. & res.).
Hospital of St. Raphael, New Haven, Conn., Capacity, 280; admissions, 7,145. Sister Rose Alexis, Superintendent (intern).
The Stamford Hospital, Stamford. Capacity, 324; admissions, 6,352. Dr. Charles H. Young, Superintendent (intern and resident).
Waterbury Hospital, Waterbury. Capacity, 369; admissions, 7,765. Aida E. Creer, R.N., Superintendent (intern).

DELAWARE

St. Francis Hospital, Wilmington. Capacity, 137; admissions, 1,874. Sr. M. Illuminata, Superintendent (intern).

GEORGIA

The Crawford W. Long Memorial Hospital, Atlanta. Capacity, 269; admissions, 8,662. Dr. L. C. Fischer, Administrator (int. & res.).
Grady Memorial Hospital, Atlanta. Capacity, 721, admissions, 13,557 residents).
The Piedmont Hospital, Atlanta. Capacity, 147; admissions, 4,276. Mr. George R. Burt, Superintendent (interns).
Saint Joseph's Infirmary, Atlanta. Capacity, 158; admissions, 4,841. Sister Cornile, Superintendent (intern).

ILLINOIS

Henrotin Hospital, Chicago. Capacity, 129; admissions, 3,139. Veronica Miller, Superintendent (intern and resident).
Loretto Hospital, Chicago. Capacity, 159; admissions, 4,235. Sr. M. Stephanie, R.N., Superintendent (intern).
Women and Children's Hospital, Chicago. Capacity, 125; admissions, 2,697. Mrs. Edna H. Nelson, Superintendent (intern women).
Pleasant View Sanatorium, East St. Louis. Capacity, 98; admissions, 178. Dr. Robinson Bosworth, Superintendent (resident tuberculosis).
The Little Company of Mary Hospital, Evergreen Park. Capacity, 281; admissions, 8,189. Mother M. Dunstan, Superintendent (intern and resident obstetrician).
The Methodist Hospital of Central Ill., Peoria. Capacity, 240; admissions, 6,240. Dr. C. S. Woods, Superintendent (intern).

INDIANA

St. Catherine Hospital, East Chicago. Capacity, 344; admissions, 9,043. Sister M. Cordula, Superintendent (intern).
The Methodist Hospital, Gary. Capacity, 140; admissions, 5,943. Rev. James Lawson, Superintendent (intern).
St. Margaret Hospital, Hammond. Capacity, 281; admissions, 8,035. Sr. M. Vincentiana, Superintendent (intern).

IOWA

St. Luke's Methodist Hospital, Cedar Rapids. Capacity, 175; admissions, 5,707. Karl P. Meister, Superintendent (mixed resident).

KANSAS

Bethany Hospital, Kansas City. Capacity, 180; admissions, 4,793. Ethel L. Hastings, R.N., Superintendent (mixed resident).
Providence Hospital, Kansas City. Capacity, 110; admissions, 2,773. Sister Mary George, R.N., Superintendent (intern).
The Wichita Hospital, Wichita. Capacity, 145; admissions, 3,777. Sister M. Agnes, Superintendent (intern).

KENTUCKY

St. Elizabeth Hospital, Covington. Capacity, 335; admissions, 5,730. Sister Mary Alocoque, Administrator (intern).
Jewish Hospital, Louisville. Capacity, 90; admissions, 2,587. Mr. Walter J. Bailey, Superintendent (resident, mixed).

LOUISIANA

North Louisiana Sanitarium, Shreveport. Capacity, 114; admissions, 3,694. Mrs. Jessie W. Sanford, R.N., Superintendent (intern).
Tri-State Hospital, Shreveport. Capacity, 140; admissions, 4,634. Mrs. Louise G. Fry, R.N., Superintendent (intern).

MARYLAND

St. Agnes' Hospital, Baltimore. Capacity, 248; admissions, 4,994. Sister Rosanna, R.N., Administrator (intern).

MASSACHUSETTS

Brockton Hospital, Brockton. Capacity, 155; admissions, 2,872. Dr. F. M. Hollister, Superintendent (intern).
Cambridge City Hospital, Cambridge. Capacity, 400; admissions, 6,632. Gertrude D. Stapleton, R.N., Superintendent (intern).
Union Hospital, Fall River. Capacity, 186; admissions, 3,725. Miss Jennie F. Smithies, R.N., Superintendent (intern).
Holyoke Hospital, Holyoke. Capacity, 155; admissions, 2,918. Mr. S. J. Barnes, Superintendent (intern).
Lynn Hospital, Lynn. Capacity, 232; admissions, 6,473. Mr. Dan Trander, Administrator (intern).
St. Luke's Hospital, Pittsfield. Capacity, 200; admissions, 3,531. Sister M. Louise, R.N., Superintendent (intern).
The Waltham Hospital, Waltham. Capacity, 215; admissions, 3,172. Mr. Walter R. Amesbury, Administrator (intern).
Worcester Hahnemann Hospital, Worcester. Capacity, 150; admissions, 3,158. Erna M. Kuhn, R.N., Superintendent (intern).
Saint Vincent Hospital, Worcester. Capacity, 313; admissions, 5,934. Sister M. Loreto, Superintendent (intern and resident).

MICHIGAN

The Grace Hospital, Detroit. Capacity, 555; admissions, 16,677. Dr. Edmund F. Collins, Medical Director (intern).
Mount Carmel Mercy Hospital, Detroit. Capacity, 550; admissions, 20,078. Sister M. Nicholas, Superintendent (intern and resident).
Blodgett Memorial Hospital, Grand Rapids. Capacity, 170; admissions, 4,553. Mr. William W. Colton, Director (intern).

MISSOURI

St. Mary's Hospital, Kansas City. Capacity, 182; admissions, 5,103. Sister Mary Athanasia, Superintendent (intern).
Christian Hospital, St. Louis. Capacity, 145; admissions, 2,760. Agnes Heman, R.N., Superintendent (resident).

NEBRASKA

Lincoln General Hospital, Lincoln. Capacity, 203; admissions, 4,262. Mr. Herbert F. Hammond, Administrator (intern).
St. Elizabeth Hospital, Lincoln. Capacity, 200; admissions, 5,252. Ven. Sr. M. Ascila, R.N., Superintendent (intern).

NEW JERSEY

Elizabeth General Hospital, Elizabeth. Capacity, 250; admissions, 5,523. Mr. W. Malcolm MacLeod, Superintendent (intern).
Englewood Hospital, Englewood. Capacity, 238; admissions, 4,893. Victoria Smith, Superintendent (intern).
St. Francis Hospital, Jersey City. Capacity, 228; admissions, 4,370. Sister Christiana, Superintendent (intern).
Monmouth Memorial Hospital, Long Branch. Capacity, 254; admissions, 6,020. Mr. O. N. Auer, Director (intern).
Newark Beth Israel Hospital, Newark. Capacity, 463; admissions, 12,159. Mr. I. E. Behrman, Director (intern).

NEW YORK

Memorial Hospital, Albany. Capacity, 146; admissions, 3,485. Ellen P. Young, R.N., Superintendent (intern and resident).
St. Peter's Hospital, Albany. Capacity, 139; admissions, 4,000. Sister Mary Esther, Superintendent (intern).
Brooklyn Eye and Ear Hospital, Brooklyn. Capacity, 143; admissions, 7,279. Mr. Henry J. Williams, Superintendent (resident otologist).
Wyckoff Heights Hospital of Brooklyn, Brooklyn. Capacity, 199; admissions, 4,337. Louis Schenkweiler, Superintendent (intern).
Charles S. Wilson Memorial Hospital, Johnson City. Capacity, 350; admissions, 6,074. Mr. Robert L. Echelberger, Administrator (intern).
Metropolitan Hospital, Welfare Island, New York. Capacity, 1,111; admissions, 10,899. Dr. Alexander W. Kruger, Med. Supt. (int).
St. Clare's Hospital, New York. Capacity, 405; admissions, 7,603. Mother Mary Alice, R.N., Superintendent (intern).
Triboro Hospital, Jamaica, Long Island. Capacity, 557; admissions, 1,112. Dr. Henry I. Fineberg, Medical Supt. (res. tbc.).
United Hospital, Port Chester. Capacity, 214; admissions, 5,089. Mr. Carl P. Wright Jr., Superintendent (intern).
St. Mary's Hospital, Rochester. Capacity, 257; admissions, 9,785. Sister Martina, Superintendent (intern and resident).
Crouse-Irving Hospital, Syracuse. Capacity, 240; admissions, 6,450. Dr. Carl E. Muench, Superintendent (intern).

NORTH CAROLINA

Charlotte Memorial Hospital. Capacity, 325; capacity, 6,706. Mr. Carl I. Flath, Administrator (intern).
Highsmith Hospital, Fayetteville. Capacity, 132; admissions, 4,236. Dr. W. T. Rainey, Medical Director (resident mixed).

OHIO

Aultman Hospital, Canton. Capacity, 214; admissions, 5,744. Mr. James W. Stephan, Director (intern).
St. Mary's Hospital, Cincinnati. Capacity, 230; admissions, 5,114. Sister Theonilla, Superintendent (intern and resident).
Lutheran Hospital, Cleveland. Capacity, 137; admissions, 4,121. Mr. Lee S. Lanpher, Superintendent (intern).
St. Alexis Hospital, Cleveland. Capacity, 220; admissions, 7,673. Sister M. Flaviana, R.N., Superintendent (intern).
Mercy Hospital, Hamilton. Capacity, 230; admissions, 4,754. Sister Mary Benignus, Superintendent (resident mixed).
Lucas County General Hospital, Toledo. Capacity, 325; admissions, 3,215. Roland E. Gregg, Superintendent (intern).
Mercy Hospital, Toledo. Capacity, 353; admissions, 8,240. Sister Mary Aquin, Superintendent (intern).
The Toledo Hospital, Toledo. Capacity, 325; admissions, 7,236. Wilson L. Benfer, Superintendent (intern).

PENNSYLVANIA

Fitzgerald-Mercy Hospital, Darby. Capacity, 251; admissions, 5,577. Dr. C. T. McCarthy, Medical Director (intern).
Easton Hospital, Easton. Capacity, 220; admissions, 5,178. S. Chester Fazio, Superintendent (intern and resident).
Harrisburg Hospital, Harrisburg. Capacity, 264; admissions, 6,540. W. S. Kohlhaas, Superintendent (intern).
Harrisburg Polyclinic Hospital, Harrisburg. Capacity, 195; admissions, 4,370. Mr. Paul H. Stauffer, Manager (intern).
Saint Joseph's Hospital, Lancaster. Capacity, 265; admissions, 4,972. Sister M. Philiberta, Superintendent (intern).
McKeesport Hospital, McKeesport. Capacity, 325; admissions, 6,313. William A. Hacker, Superintendent (intern).
The Babies' Hospital of Philadelphia, Philadelphia. Capacity, 15; admissions, 311. Laura E. McClure, Medical Director (resident pediatrician).
Northeastern Hospital of Philadelphia, Philadelphia. Capacity, 102; admissions, 2,921. A. H. Brittingham, Superintendent (intern).
Saint Mary's Hospital, Philadelphia. Capacity, 250; admissions, 4,541. Sister Mary Gertrude, Superintendent (intern).
St. Margaret Memorial Hospital, Pittsburgh. Capacity, 150; admissions, 2,886. Adele M. Polk, R.N., Superintendent (intern).
Community General Hospital, Reading. Capacity, 134; admissions, 2,637. Olin L. Evans, Superintendent (intern).
The Hahnemann Hospital, Scranton. Capacity, 125; admissions, 2,632. L. R. Robbins, Superintendent (intern).
Mercy Hospital, Wilkes-Barre. Capacity, 220; admissions, 4,586. Sister Mary Avellino, R.N., Superintendent (intern).

RHODE ISLAND

St. Joseph's Hospital, Providence. Capacity, 360; admissions, 7,883. Mother M. Evangelist (intern).

SOUTH CAROLINA

Greenville General Hospital, Greenville. Capacity, 315; admissions, 7,007. J. B. Norman, Superintendent (intern).

TENNESSEE

St. Thomas Hospital, Nashville. Capacity, 211; admissions, 6,699. Sister Lydia, Superintendent (intern).

TEXAS

Methodist Hospital of Dallas. Capacity, 206; admissions, 5,545. E. B. Germany, Chairman, Administration Committee (intern).
Medical and Surgical Memorial Hospital, San Antonio. Capacity, 157; admissions, 5,440. Mrs. Alfreda P. Hassell, R.N., Superintendent (intern).
King's Daughters Hospital, Temple. Capacity, 124; admissions, 2,711. Ruby B. Gilbert, Superintendent (intern).

UTAH

Thomas D. Dee Memorial Hospital, Ogden. Capacity, 260; admissions, 6,965. Lawrence H. Evans, Superintendent (intern).

VIRGINIA

The Chesapeake and Ohio Hospital, Clifton Forge. Capacity, 146; admissions, 4,000. Miss Louise M. Reynolds, R.N., Superintendent (intern and resident surgery).
Elizabeth Buxton Hospital, Newport News. Capacity, 149; admissions, 4,375. Dr. Russell Buxton, Superintendent (mixed residents).

WASHINGTON

Pierce County Hospital, Tacoma. Capacity, 239; admissions, 2,776. Dr. Burton A. Brown, Administrator (intern).

WEST VIRGINIA

St. Francis Hospital, Charleston. Capacity, 118; admissions, 3,602. Sister M. Consilia, Administrator (mixed residents).
The Camden-Clark Hospital, Parkersburg. Capacity, 183; admissions, 3,533. Mrs. Grace M. Short, R.N., Superintendent (intern).

WISCONSIN

St. Francis Hospital, La Crosse. Capacity, 292; admissions, 5,518. Sister M. Fridoline, R.N., Superintendent (intern).
Milwaukee County Hospital, Milwaukee. Capacity, 1,075; admissions, 12,092. H. W. Sargeant, Superintendent (intern).
Mercy Hospital, Oshkosh. Capacity, 224; admissions, 4,783. Sister M. Laurentina, Superintendent (intern).
St. Mary's Hospital, Racine. Capacity, 271; admissions, 5,396. Sister M. Bonaventure, Superintendent (intern).

V 1
194

MISCELLANEOUS

HOUSE COMMITTEE DENIES FUNDS FOR RELOCATED PHYSICIANS

Attention was directed in THE JOURNAL, October 16, to the fact that supplemental estimates had been submitted by the President to the Congress for additional funds to enable the United States Public Health Service, either through its own personnel or by the payment of monthly stipends to civilian physicians, to provide medical services in certain critical areas. The House Committee on Appropriations has now reported to the House the First Supplemental National Defense Appropriation Bill for the fiscal year ending June 30, 1944, H. R. 3598, and has failed to include therein the additional appropriation requested. In explanation of its failure to provide the additional sums, the committee in its report said:

"The budget request contains an item of $1,000,000 for emergency medical care to provide doctors for areas, principally war industry areas, where the number of civilian physicians and dentists is inadequate for normal medical attention of the population. The amount contemplated $573,000 for salaries and travel of 300 commissioned officers of the Public Health Service for such assignments and $375,000 for three months' pay ($750 each) and travel expenses ($500 each) for the relocation of 300 private physicians. The committee has not approved this request.

"Undoubtedly a critical situation exists in many areas due to the recruitment for the armed forces of approximately 50,000 doctors. The committee is advised that there are approximately 185,000 doctors in the United States counting those up to 101 years of age. Of these the armed forces have taken 50,000, leaving 135,000 doctors in the country available for the civilian population. An estimate made to the committee by a prominent medical authority indicates that some 40,000 to 50,000 of the 135,000 are ineffective practitioners, leaving approximately 85,000 to 95,000 effective physicians to do the work formerly done by the larger number. The Public Health Service advises that there are in the United States at this time some 213 communities that need physicians and dentists with a minimum need of 295 physicians and 53 dentists. This list is printed commencing on page 979 of the hearings. The survey of need throughout the United States is still incomplete. Surgeon General Parran has advised that in his opinion the situation in many areas is acute.

"The committee in rejecting the budget request does not minimize the need or the seriousness of the situations which exist. It does hesitate to inaugurate a program of this character with federal funds to provide direct medical attention to the civilian population with physicians paid by the federal government. The committee has the opinion that out of the cooperative efforts of the federal government, the medical associations, the state departments of health and the communities themselves there will and should come a concerted and spontaneous effort to provide this need. Most of it is in war industry areas and it is inconceivable that such communities working with the industries, the affected population and state and local authority cannot inaugurate and maintain an adequate public spirited program, financially sound, to serve this need. If the affected areas cannot and will not solve their local needs it may be necessary for the federal government in the interest of the general public health to step in, but until then the committee feels that federal funds should be withheld under the contemplated procedure."

WARTIME GRADUATE MEDICAL MEETINGS

A Wartime Graduate Medical Meeting was held Friday, October 29, at the O'Reilly General Hospital in Springfield, Mo., for the medical officers of O'Reilly, Fort Leonard Wood, Camp Crowder and the civilian doctors of the Eighth Councilor District of the Missouri State Medical Association. The program included the following papers: Pencillin Therapy, Major Edward P. Burch; Present Day Status of the Sulfonamides, Dr. Paul Hageman; Tropical Diseases and Malaria, Dr. Russell Blattner; Trauma of the Abdomen, Dr. L. P. Engel; Reconstructive Surgery of War Wounds, Major William S. Kiskadden; Psychiatric Problems in General Hospitals, Capt. Clarence M. Schrier; Low Back Pain and Disability: Orthopedic Point of View, Dr. Frank D. Dickson and Capt. William H. Meade.

The attendance was 300, about equally divided between medical officers and civilian doctors. Among the civilian group were men from all parts of the state, with councilors and officers of the state association well represented.

GERMAN DRUGS AND PHARMACEUTICALS SEIZED

According to the Office of War Information, Alien Property Custodian Leo T. Crowley announced on October 21 the seizure by his agents at San Juan, Puerto Rico, of twenty-five cases of German drugs and pharmaceuticals estimated to have a sales value of more than $100,000. The seized medicinal products, which originated in La Quimica Bayer, S. A., of Buenos Aires, Argentina, a wholly owned subsidiary of I. G. Farbenindustrie of Germany, were consigned to the German Bayer subsidiary in Venezuela. The seizure of this cargo is a major blow at the German Bayer organization in Venezuela, which has not received a shipment since October 1942 and which consequently is almost without supplies. The merchandise in the seized cargo is in sufficient volume to have carried their business for almost a year. The financial loss to the Bayer subsidiary in Argentina as a result of the seizure is also considerable. Assurances have been given to the Venezuelan government that the seizure will not be allowed to jeopardize the public health in that country.

MEDICAL AND SURGICAL RELIEF COMMITTEE OF AMERICA

The Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York City, presented medical and surgical equipment to set up a battle dressing station on the cruiser the U. S. S. *Boston* to Rear Admiral Luther Sheldon Jr. (MC), U.S.N., who accepted the donation in the name of the Secretary of the Navy, Frank Knox. The equipment consisted of an emergency medical field set, an operating kit and supplemental instruments.

More than $1,000 worth of surgical equipment was also donated by the Medical and Surgical Relief Committee to the French Red Cross in Algiers, North Africa, to help rehabilitate wounded French soldiers and to relieve the shortage of critical medical supplies. This donation makes a total of more than $8,000 worth of medical and surgical equipment sent by the committee to North Africa during the past five months.

PUBLIC HEALTH UNDER HITLER

According to the *Frankfurter Zeitung* of August 21 a report from Berlin says that over 5,500 factories today are cared for by works doctors. The question has been repeatedly raised whether the workers of these factories are under an obligation to let themselves be examined by the works doctor on demand in the case of inability to work. According to the present conception of law this obligation exists only if it is explicity laid down in the wages and factory regulations or in individual labor contracts. A general obligation to submit to an examination by the works doctor did not exist until now. The Office for Social Self Responsibility of the DAF has expressed its opinion that this conception can no longer be maintained. The employer is responsible for the orderly working effort of his workers. Therefore he must be able, if necessary, to let the works doctor establish whether the worker is capable for work or not. The worker's duty of loyalty therefore demands that he submit to examination by the works doctor.

Volya, Plovdiv, of July 9 states that in autumn the chief public health directorate will open a hospital in Sofia for children suffering from infantile paralysis. Children whose parents cannot look after them properly will be treated there.

ORGANIZATION SECTION

OFFICIAL NOTES

ANNUAL CONFERENCE OF SECRETARIES AND EDITORS

The Annual Conference of Secretaries and Editors of Constituent State Medical Associations will be held at the offices of the Association in Chicago on November 19 and 20. The program will be as follows:

FRIDAY, NOVEMBER 19, 10 A. M.

Call to Order. Roger I. Lee, Chairman of the Board of Trustees of the American Medical Association.

Address. James E. Paullin, President of the American Medical Association.

Problems Relating to Assignment of Duties of Military Surgeons. George F. Lull, Deputy Surgeon General, United States Army.

Hospital Training of Medical Graduates. Victor Johnson, Secretary, Council on Medical Education and Hospitals of the American Medical Association.

12:30 p. m. LUNCHEON at the Kungsholm, corner of Ontario and Rush streets.

FRIDAY, NOVEMBER 19, 2 P. M.

Address. Herman L. Kretschmer, President-Elect of the American Medical Association.

Cooperative Relationship of Procurement and Assignment Service and State Medical Associations. Harold S. Diehl, member, Directing Board, Procurement and Assignment Service for Physicians, Dentists and Veterinarians.

The War Participation Committee as a Coordinating Agency. Walter F. Donaldson, chairman, War Participation Committee of the American Medical Association.

The Work of the Council on Medical Service and Public Relations. Louis H. Bauer, chairman, Council on Medical Service and Public Relations of the American Medical Association.

FRIDAY, NOVEMBER 19, 6:30 P. M.

DINNER MEETING OF EDITORS OF STATE MEDICAL JOURNALS
PALMER HOUSE, CRYSTAL ROOM

Wingate M. Johnson, editor of the *North Carolina Medical Journal*, presiding.

The Council on Pharmacy and Chemistry. Austin E. Smith, Secretary, Council on Pharmacy and Chemistry of the American Medical Association.

The Cooperative Medical Advertising Bureau. Open discussion.

SATURDAY, NOVEMBER 20, 9:30 A. M.

Medical Legislation in Congress. J. W. Holloway Jr., director, Bureau of Legal Medicine and Legislation of the American Medical Association.

Obstetric and Pediatric Care for the Wives and Children of Service Men. L. Fernald Foster, secretary of the Michigan State Medical Society.

ELECTRICAL TRANSCRIPTIONS IN HEAVY DEMAND

Electrical transcriptions for radio broadcasting for local medical societies prepared by the Bureau of Health Education in two series, American Medicine Serves the World at War and Before the Doctor Comes, became available September 1.

The entire supply available is now in use. An advance schedule is being maintained. Medical societies and auxiliaries desiring the use of transcriptions should file applications for advance dates with the Bureau of Health Education.

The series Before the Doctor Comes consists of sixteen broadcasts in interview form giving advice to the mother as to what to do and what not to do under certain circumstances "before the doctor comes." The series American Medicine Serves the World at War began with six interviews dealing with wartime problems and how they are being solved in various localities. Two additional broadcasts will soon be added to the series, which will be augmented from time to time as opportunity arises.

The Bureau of Health Education is beginning preparations for a third series of transcriptions entitled Contagious Diseases in the Home. This series should be ready approximately Feb. 15, 1944.

V 1
194

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—H. R. 3598 has passed the House, making appropriations to supply deficiencies in certain appropriations for the fiscal year ending June 30, 1944 and to provide supplemental appropriations. As reported to and passed by the House, this bill fails to appropriate the amount requested by the President for emergency medical care to provide doctors and dentists for areas where the number of civilian physicians and dentists is inadequate for normal medical and dental attention of the population. The bill does include a supplemental appropriation of $7,500,000 for the training of nurses and an appropriation of $10,356,000 to provide additional hospital and domiciliary facilities for veterans. The committee report indicates that this amount will be expended to provide facilities for neuropsychiatric patients.

Bills Introduced.—H. Con. Res. 51, submitted by Representative Schiffler, West Virginia, proposes to request the Social Security Board to create a special advisory council to investigate the extension of the federal old age and survivors insurance system to include persons in the armed forces, and also the extension of unemployment allowances after termination of military service. H. R. 3603, introduced by Representative Sumners, Texas, proposes to regulate the commitment of insane persons to veterans' and other United States institutions. H. R. 3610, introduced by Representative Rowan, Illinois, provides for a program of research in universities, colleges and other institutions of higher learning, for the prevention of the pollution of the waters of the United States and to establish a Water Pollution Control and Sewage Utilization Board, to be composed of the Secretary of Agriculture, the Surgeon General of the Public Health Service and one other person to be appointed jointly by the Secretary of Agriculture and the Surgeon General. H. R. 3623, introduced by Representative Rogers, Massachusetts, proposes to establish a permanent medical service in the Veterans Administration which will constitute a component part of the military forces of the United States.

WOMAN'S AUXILIARY

Kansas

The Wyandotte County Medical Auxiliary recently held a dessert luncheon and book review, at which time they reported fifteen new members.

The Sedgwick County auxiliary decided to hold only three meetings during the year. Mrs. James Hibbard, Wichita, is the new president.

At a meeting of the Kansas auxiliary recently the following officers were elected:

Mrs. E. E. Tippin, Wichita, president; Mrs. Leo J. Schaefer, Salina, president-elect; Mrs. C. D. Blake, Hayes, first vice president; Mrs. M. A. Brawley, Frankfort, second vice president; Mrs. H. L. Regier, Kansas City, secretary, and Mrs. E. N. Robertson, Concordia, treasurer.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Dr. Pelouze to Lecture on Gonorrhea.—Dr. Percy S. Pelouze, associate professor of urology, University of Pennsylvania School of Medicine, Philadelphia, and special consultant for the gonorrhea control program of the U. S. Public Health Service, will address county and district medical societies in Arkansas, March 13-24, under the auspices of the public health service.

District Meetings.—The Fifth Councilor District Medical Society was addressed in Camden, October 7, by Drs. Henry King Wade, Hot Springs National Park, on "Cancer of the Prostate"; Joseph F. Shuffield, Little Rock, "Fractures of the Hip"; Byron L. Robinson, Little Rock, "Medical Education," and William R. Brooksher, Fort Smith, "The Wagner-Murray Bill." —— The First Councilor District Medical Society of Northeast Arkansas held its eighty-second semiannual meeting in Jonesboro, October 21, with the following speakers: Capt. Louis J. Benton, M. C., A. U. S., on "Some Uses and Disuses of the Sulfonamides"; Lieut. Harry Cohen, M. C., A. U. S., "Practical Consideration in Treatment of Early Syphilis"; Dr. Pearlie W. Lutterloh, Jonesboro, "Highlights of the Wagner Bill," and Dr. Robert H. Willett, Jonesboro, "Relative Value of Deep X-Ray Therapy in Lobar Pneumonia."

CALIFORNIA

Dr. Wagner Placed in Charge of Tuberculosis Control.—Dr. William F. Wagner, resident physician at Olive View Sanatorium, Olive View, has been appointed chief of the division of tuberculosis control in the San Francisco city and county department of health.

Medical Missionary Repatriated.—Dr. Ralph C. Lewis, Shunteh, Hopeh, China, medical missionary to China, is expected to be among the exchange prisoners aboard the *Gripsholm*, newspapers recently reported. Dr. Lewis was with the American Presbyterian Mission, Hugh O'Neill and Grace Talcott Memorial Hospital, Shunteh.

Vesalius Celebration.—The California Academy of Sciences met on October 6 at the University of California Medical School, San Francisco, to observe the 400th anniversary of the publication by Vesalius of "De Humani Corporis Fabrica." The principal address was delivered by Dr. John B. De C. M. Saunders, chairman of the department of anatomy, on "Andreas Vesalius, the Anatomist."

Latin American Gives Herzstein Lectures.—Dr. Oscar Ivanissevich, professor of surgery and director of the Surgical Institute of the University of Buenos Aires, will deliver the Morris Herzstein Medical Lectures for 1943 in San Francisco in November under the auspices of the medical schools of Stanford University and the University of California. Dr. Ivanissevich, who is serving as exchange professor of surgery at Stanford University School of Medicine during October and November, will speak November 15 on "General Consideration of Echinococcosis," November 17 on "Echinococcosis of the Liver" and November 19 on "Echinococcosis of the Lung."

COLORADO

State Medical Election.—Dr. Edward R. Mugrage, Denver, was chosen president-elect of the Colorado State Medical Society at the recent annual meeting of the house of delegates in September and Dr. George P. Lingenfelter, Denver, was installed as president. Dr. George M. Myers, Pueblo, was chosen vice president. Dr. John S. Bouslog, Denver, is secretary.

The Friedman Lectures.—Dr. Walter S. Maclay, medical officer in charge of the Mill Hill Emergency Hospital, London, England, delivered the Friedman Lectures on November 2 and 3 under the auspices of the National Jewish Hospital, Denver, in cooperation with the Medical Society of the City and County of Denver and the University of Colorado School of Medicine, Denver. The first lecture was entitled "Newer Developments in the Neuroses—Their Significance in General Medicine" and a second, in the form of a conference, conducted by Drs. Maclay, Bradford J. Murphey and Charles A. Rymer, Denver, on "Psychosomatic Problems." Dr. Maclay is touring the United States under the auspices of the American Psychiatric Association.

ILLINOIS

Dr. Earle Returns from Latin America.—Dr. Walter C. Earle, who has been supervising a federally financed health and sanitation program in Latin America, principally on malaria, has returned as director of the Champaign-Urbana Public Health District. During his absence his work was carried on by Dr. Raymond V. Brokaw, Springfield, director of the division of cancer control of the state department of public health.

Physician Repatriated.—Dr. Albert M. Dunlap, native of Savoy, who had practiced medicine in China since 1910, is being repatriated. He is expected to arrive aboard the *Gripsholm* in New York about December 2. Dr. Dunlap graduated at Harvard Medical School, Boston, in 1910, going to China the same year. Four years later Dr. Dunlap joined the Peiping Union Medical College, Pekin, serving as professor of otolaryngology and from 1926 to 1928 as dean of the college.

Dr. Watson Named Chief Medical Officer.—Dr. James Watson, director of the division of mental hygiene, North Carolina State Board of Charities and Public Welfare, Raleigh, has been appointed chief medical officer in the Illinois State Department of Public Welfare to succeed Dr. Conrad S. Sommer, who recently became deputy director of the mental hygiene service in the department of public welfare (THE JOURNAL, October 23, p. 495). Dr. Watson, in his position as chief medical officer, will be responsible for the medical care and treatment of patients in state hospitals. His new appointment will be effective December 1.

Chicago

Meeting on Tropical Diseases.—A joint meeting of the Chicago Medical Society and Aux Plaines Branch, November 17, will be devoted to a consideration of tropical diseases. Lieut. John E. Choisser (MC), U. S. Naval Reserve, will speak on "Filariasis" and Lieut. Philip A. Arling (MC), U. S. Naval Reserve, "Malaria."

The Bacon Lectures.—Dr. Louis E. Phaneuf, professor of gynecology, Tufts College Medical School, Boston, will deliver the Charles Sumner Bacon Lectures for 1943-1944 at the University of Illinois College of Medicine, December 1-2. Dr. Phaneuf's subjects will be: "Some Notes on the Life of J. Marion Sims, and on the History of Vesico-Vaginal Fistula" and "The Management of Complete Lacerations of the Perineum and Recto-Vaginal Fistula."

Course in Electrocardiographic Interpretation.—A course in electrocardiographic interpretation for graduate physicians will be given at Michael Reese Hospital by Dr. Louis N. Katz, director of cardiovascular research. The class will meet each week starting Thursday February 17 for twelve weeks from 7 to 9 p. m. Further information and a copy of the program may be obtained on application to the Cardiovascular Department, Michael Reese Hospital.

Meeting of Bacteriologists.—The fall meeting of the Society of Illinois Bacteriologists will be held in the Chicago Illini Union, November 19. The speakers will be John C. Sylvester, Ph.D., North Chicago, Ill., on "Penicillin Production and Clinical Value"; Albert Milzer, Ph.D., and Drs. Philip Lewin and Sidney O. Levinson, co-authors, "The Effect of Fatigue, Chilling and Trauma on Resistance to Experimental Poliomyelitis," and Dr. Henry M. Lemon, Henry Wise, M.S., and Dr. Morton Hamburger, Chanute Field, Ill., co-authors, "A Study of the Bacterial Contents of the Air of Army Barracks."

Personal.—Dr. Herman L. Kretschmer, President-Elect of the American Medical Association, received the honorary degree of doctor of science from Marquette University School of Medicine, Milwaukee, during its commemoration exercises, October 18. Dr. Kretschmer gave the commencement address, entitled "Medical Education, the War and You."——Dr. William W. Bauer, Director of the Bureau of Health Education of the American Medical Association, has been elected to the governing council of the American Public Health Association for a three year term expiring in 1946.——Dr. Raymond J. L. Norfray has been appointed assistant to Dr. William H. Haines, director of the Cook County Behaviour Clinic.

Anatomists Honored.—Reuben M. Strong, Ph.D., professor and chairman of the department of anatomy at Loyola University School of Medicine, and Thesle T. Job, Ph.D., professor of anatomy, were honored at a dinner in the Medinah Club, October 31, given by the student body, marking their

completion of twenty-five years as members of the faculty. Speakers at the dinner included Dr. Raymond B. Allen, dean, University of Illinois College of Medicine; Dr. Basil C. H. Harvey, professor emeritus of anatomy, University of Chicago School of Medicine; Leslie B. Arey, Ph.D., embryologist; Dr. John L. Keeley, assistant clinical professor of surgery at Loyola, and Rev. Joseph M. Egan, S.J., president of Loyola.

Dr. Anderson Joins American Medical Association.—Dr. George K. Anderson, technical aide, division of medical sciences of the National Research Council, Washington, D. C., became Secretary of the Council on Foods and Nutrition of the American Medical Association, November 4. Dr. Anderson graduated at the University of Rochester School of Medicine and Dentistry, Rochester, N. Y., in 1938 serving his internship at the Strong Memorial Hospital in Rochester. After he completed residencies at the Children's Hospital, Cincinnati, and at the Strong Memorial Hospital, Dr. Anderson served as pediatric consultant for the North Carolina State Board of Health and professor of pediatrics at the University of North Carolina School of Public Health, Chapel Hill.

Graduate Course in Endocrinology.—On October 11-16 a graduate course in endocrinology was given as a part of a postgraduate program of the American College of Physicians in cooperation with the University of Illinois College of Medicine and the Presbyterian Hospital under the direction of Dr. Willard O. Thompson. Seventy-four registrations represented the following states and Canadian provinces: California, Colorado, Delaware, Florida, Illinois, Indiana, Iowa, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Nebraska, New Mexico, Ohio, Pennsylvania, South Dakota, Texas, Utah, Wisconsin, Alberta and Ontario. Most of the attendants at the course are engaged in the practice of internal medicine in their respective communities and many are working in special clinics devoted to the study of endocrine diseases.

INDIANA

Personal.—Dr. Herman M. Baker, Evansville, was chosen president of the Indiana State Board of Health at its meeting, recently. Dr. Baker has been a member of the board for a number of years and has also previously served as president. ——Dr. William D. Weis, Crown Point, health commissioner of Lake County, on September 4 was elected president of the Old Settlers and Historical Association. ——Dr. Bertis C. Gwaltney, Fort Branch, health officer of Gibson County, has been appointed assistant collaborating epidemiologist of Indiana.

Stream Pollution Board.—The creation of a state stream pollution control board was made possible under the enactment of 1943 legislation. Members of the board include Leo Besozzi, consulting engineer of Hammond, George C. Hillenbrand, manufacturer, Batesville, Joseph L. Quinn, technical secretary of the board, appointed by the state board of health, Cecil K. Calvert, bacteriologist, superintendent of purification, Indianapolis Water Company, Hugh J. Barnhart, director, state department of conservation, and Dr. Thurman B. Rice, Indianapolis, chairman, acting state health commissioner, as ex officio member.

IOWA

Interprofessional Meeting.—Miss Stella Scott, R.N., Iowa City, was reelected president of the Iowa Interprofessional Association at its meeting in Des Moines, October 6, and Dr. Alonzo L. Jenks Jr., Des Moines, secretary. Dr. John W. Billingsley, Newton, discussed the Wagner-Murray-Dingell bill and Dr. Walter L. Bierring, state health officer, Des Moines, the history of chemotherapy.

State Mental Hygiene Association Proposed.—Dr. Norman D. Render, Clarinda, has been named chairman of a committee to develop an Iowa State Mental Hygiene Association. A number of superintendents of state institutions under the state board of control recently met in a preliminary session with Dr. Walter L. Bierring, state health officer, to discuss the possibilities of a state society, but final organization will not be effected until spring.

Personal.—Howard Reynolds, Ph.D., assistant professor of home economics, University of Arkansas, Fayetteville, has been appointed assistant professor of bacteriology at Iowa State College of Agriculture and Mechanic Arts, Ames; he will also be in charge of research on food bacteriology for the Iowa Agricultural Experiment Station. Lester O. Krampitz, Ph.D., assistant in physiology of the Rockefeller Institute for Medical Research, New York, resigned on September 1 to accept an appointment as research associate at Iowa State College to have charge of the study of penicillin carried out by the Industrial Science Research Institute. —— Dr. Frank M. Fuller, Keokuk, since 1925 a member of the Iowa State Board of Medical Examiners, has resigned. He has been succeeded by Dr. Arthur D. Woods, State Center. Dr. Fuller, a former president of the state medical society, was secretary of the state board from 1925 to 1937.

MARYLAND

Rheumatic Fever and Rheumatic Heart Disease Reportable.—On September 23 rheumatic fever was added to the list of reportable diseases by the state department of health. A release from the state department of health states that among children between the ages of 5 and 14 years of age in Maryland rheumatic fever and rheumatic heart disease caused more deaths than any other disease except tuberculosis. The release states further that in the United States in 1941 there were 497 deaths from rheumatic fever between the ages of 5 to 12 and 1,206 deaths in the same age group from tuberculosis. In Maryland for the same year there were 13 deaths in the age group from 5 to 14 from rheumatic fever and 30 deaths from tuberculosis.

Five Year Morbidity Study Ends.—The U. S. Public Health Service and the Milbank Memorial Fund have concluded a five year morbidity study in wards 6 and 7 of the Eastern Health District. Miss Jean Downes of the fund supervised the work, which was carried out in cooperation with the Johns Hopkins School of Hygiene and Public Health and the Baltimore Department of Public Health. The chief aims of the study were to ascertain the maximum amount of illness in a population composed of families and to learn more about the chronic diseases which are a major cause of disability. To achieve these aims a responsible member of each family in the study was asked to give information concerning the illnesses in the family to a field worker, who made a visit once a month. Slightly more than 2,000 families participated in the study. The records of sickness, which were collected over a period of five years, are strictly confidential and are to be used for statistical purposes only.

MASSACHUSETTS

License Revoked.—The Massachusetts Board of Registration in Medicine revoked the license of Dr. Theodore Rosen, Brookline, October 6, because of "gross misconduct in the practice of his profession as shown by his conviction in court."

Alumni Lecture.—Brig. Gen. Raymond W. Bliss, M. C., U. S. Army, assistant to the surgeon general, Washington, D. C., will deliver the Tufts Medical Alumni Lecture, November 17, at the medical school, Boston. His subject will be "Plans and Operations of the Surgeon General's Office."

MICHIGAN

Changes in Health Officers.—Dr. Charles F. Atkinson, Indian River, has been appointed medical director of district number 1 of the state health department located at Lake City. ——Dr. Albert F. Litzenburger, Boyne City, has been appointed director of district health unit number 3 with headquarters in Charlevoix and serving Charlevoix, Emmet, Antrim and Otsego counties. ——Dr. Thomas S. Davies has been named health commissioner of the Grosse Pointe townships, succeeding Dr. Benjamin H. Warren, resigned.

Training Course in Industrial Hygiene for Plant Safety Personnel.—The Michigan Industrial Hygiene Society and the School of Public Health of the University of Michigan, Ann Arbor, cooperated in an "in-service training course in industrial hygiene for plant safety personnel," October 19-21. Among the speakers were:

Henry F. Vaughan, Dr.P.H., Ann Arbor, Orientation.
Dr. Clarence D. Selby, Detroit, The Significance of Industrial Hygiene.
O. F. Lehman, Detroit, The Relationship of the Safety Engineer to Industrial Hygiene.
Boyd R. Sayers, medical director, U. S. Public Health Service, Environmental Aspects of Industrial Hygiene.
William G. Frederick, Sc.D., Detroit, Control of Solvent Vapors and Acid Mists.
Helmuth H. Schrenk, Ph.D., Pittsburgh, Control of Smokes, Fumes and Gases.
J. J. Bloomfield, senior sanitary engineer, U. S. Public Health Service, Evaluation and Control of Dust.
W. N. Witheridge, Detroit, Industrial Ventilation Practices.
J. A. Purdy, Detroit, Personal Protective Clothing and Equipment.
Louis Schwartz, medical director, U. S. Public Health Service, Causative Agents of Industrial Dermatitis.
Herbert G. Dyktor, Lansing, Plant Sanitation.
W. L. Lovett, Detroit, Maintenance and Its Relation to Safety and Health.
A. C. Funke, Detroit, How to Make a Survey for Health Hazards.
John W. Gibson, Detroit, How to Sell Industrial Hygiene to the Worker.
Dr. Kenneth E. Markuson, Lansing, How to Utilize the Resources of Official and Private Industrial Hygiene Agencies.

Mental Hygiene Unit for Marquette.—The fifth mental hygiene unit to be established under the state's program will be established in Marquette. Recently only two cities submitted bids for this unit, Marquette and Escanaba (THE

JOURNAL, September 18, p. 158). The state will submit about $12,000 in professional salaries to the new child guidance clinic, while the host county will be expected to provide about $3,000 worth of quarters, equipment and secretarial services. All the clinics are organized and supervised by the Michigan State Hospital Commission. Their functions are for the diagnosis and treatment of behavior and personality disorders of children and the promotion of preventive and educational programs.

MINNESOTA

The Bell Lecture.—Dr. John B. Barnwell, associate professor of internal medicine, University of Michigan Medical School, Ann Arbor, will present the tenth annual John W. Bell Lecture, November 29, Minneapolis, on "Tuberculosis Contacts in Hospital Personnel." The Bell Lecture is sponsored jointly by the Hennepin County Tuberculosis Association and the Hennepin County Medical Society.

MISSOURI

The Barnard Lecture.—Clarence C. Little, Sc.D., Bar Harbor, Maine, will deliver the annual Barnard Free Skin and Cancer Hospital Lecture before the St. Louis Medical Society, November 16, on "Influence of Heredity in Human Cancer."

Personal.—An honorary degree of doctor of science was given Dr. Joseph Grindon Sr., St. Louis, by St. Louis University at a surprise party in honor of his eighty-fifth birthday on August 20. Dr. Grindon was guest at a dinner given in his honor by the St. Louis Dermatological Society at the Coronado Hotel, St. Louis, August 30.—Dr. Sherwood Moore, director of the Edward Mallinckrodt Institute of Radiology of Washington University, St. Louis, and president of the American Roentgen Ray Society, has been appointed a member of the National Advisory Cancer Council by Surg. Gen. Thomas Parran of the U. S. Public Health Service.

NEW YORK

Graduate Lectures.—Dr. Joseph Ernest Del Monico, associate professor of clinical surgery, Syracuse University College of Medicine, Syracuse, will discuss "Plasma Therapy and Whole Blood Transfusion" before the Tompkins County Medical Society, Ithaca, November 16. Dr. Forrest O. J. Young, associate professor of surgery (plastic surgery), University of Rochester School of Medicine and Dentistry, Rochester, discussed "The Early and Late Treatment of Burns" before the Steuben County Medical Society on November 11 in Bath. The lectures are presented under the joint auspices of the state medical society and the state department of health.

New York City

Mobile X-Ray Unit for Paderewski Hospital.—A complete mobile x-ray laboratory is available for eventual use at the Paderewski Polish Hospital, Edinburgh, Scotland. It was developed by the Westinghouse X-Ray Division and purchased by donations from sixty-five American cities.

Division of Industrial Hygiene Created.—Dr. Nathan Millman, Brooklyn, has been appointed director of the new division of industrial hygiene established as a joint program of the state department of labor, the New York City Health Department and the U. S. Public Health Service. An experimental program for six months will be carried out in the Astoria, Long Island, area.

The Second Harvey Lecture.—Francis J. W. Roughton, Ph.D., fellow of Trinity College and lecturer in physicochemical aspects of physiology, Cambridge University, Cambridge, England, will deliver the second Harvey Society Lecture of the current series at the New York Academy of Medicine, November 18. Dr. Roughton's subject will be "Recent Work on the Respiratory Chemistry of the Blood."

Columbia University News.—Recent appointments to Columbia University College of Physicians and Surgeons include those of Drs. Conrad Berens as professor of clinical ophthalmology and James M. Smith as professor of clinical otolaryngology. Donald H. Cook, Ph.D., of the School of Tropical Medicine at San Juan, P. R., has been appointed visiting professor of chemistry at Columbia University. The university has received 103 cash gifts totaling more than $199,000 to finance research in medicine, chemistry and allied sciences as well as to support studies in economics, history, philosophy and statistics. A contribution of $23,310 from the Commonwealth Fund will be used to finance studies in the department of obstetrics and gynecology.

Personal.—Col. George Baehr, chief medical officer, U. S. Office of Civilian Defense, Washington, D. C., and a member of the public health council of the state of New York, has been elected a member of the board of managers of the State Charities Aid Association.—The Bronx Council of the American Jewish Congress has presented Dr. Thomas H. Curtin, president of the Bronx Interfaith Council, with its good citizen award for 1943 in recognition of his efforts toward bringing about "better understanding among men of all faiths."—Dr. Oswald S. Lowsley recently returned from a lecture tour of Central American countries. He conducted conferences and operative clinics in Tegucigalpa, Honduras, San Salvador, Guatemala and Mexico.

Report of Cancer Clinics.—Of 654 persons examined in the cancer prevention clinics of Memorial Hospital for the Treatment of Cancer and Allied Diseases during a period of twenty-eight months, 263 came without complaint or symptoms. According to the *Bulletin* of the American Society for the Control of Cancer 49 were found to have malignant tumors, 162 had benign tumors, 25 had other serious diseases such as heart disease, gastric ulcers and tuberculosis, and 155 were without demonstrable evidence of disease. Of those who applied for examinations 7.5 per cent were found to have cancer, the majority having malignant tumors in the early stages. Of the total group who came to the clinic 29 per cent had benign tumors, 30 per cent had constitutional diseases and 33 per cent showed no disease. Of the 263 who applied but who were unaware of any symptom of disease at the time of their first visit, 4 had malignant tumors, 50 had benign lesions, 15 had some type of serious disease and 194 had no evidence of disease. Revisits to the clinic within a year amounted to 60 per cent. Ten per cent returned in six months.

OHIO

The Lower Lecture.—Dr. Irvine H. Page, director, Lilly Clinic, Indianapolis City Hospital, Indianapolis, will deliver the annual Lower Lecture before the Academy of Medicine of Cleveland, November 19. His subject will be "The Nature of Hypertension."

New Health Council.—The Columbus Council of Social Agencies has organized a health council to promote the coordination of public and private health work and to aid in securing continuity of program. Under the plan, eight members of the Columbus Academy of Medicine will serve as members of the new health council: Drs. George T. Harding, president of the academy, William D. Inglis, president-elect, George J. Heer, Jonathan Forman, Francis A. Riebel, Clifford C. Sherburne, president, Ohio State Medical Association, Charles W. Pavey and Donald F. Bowers. Dr. Russel G. Means, formerly president of the academy, is chairman of the health council and is one of the eight additional members named by the council of social agencies. Included in the latter group also is Dr. Nelson C. Dysart, health commissioner of Columbus. The combined sixteen members are to select the remaining five persons composing the full membership of the council. Other objectives of the new group are:

To serve as a forum for discussion of health, sickness problems, policies and plans.

To develop new standards of service and to improve present standards, through joint study of special problems.

To secure improvement in existing health facilities and services and the establishment of new and additional health facilities or services where needed.

To assist the official and nonofficial agencies in bringing their personnel to a level which meets acceptable standard qualifications.

To cooperate with official and nonofficial health agencies for the provision of refresher courses and in-service training, with allocation of time and financial assistance for such purposes if necessary for additional education to meet the standards of national health agencies.

To prevent duplication of effort.

To give moral support to health departments and to aid in community health education in cooperation with the medical and dental societies and other participating agencies.

Society Presents Plan for Obstetric Care of Service Men's Wives.—The Montgomery County Medical Society adopted a resolution, October 13, urging the establishment of a private antepartum clinic at the Good Samaritan, Miami Valley and St. Elizabeth hospitals, Dayton, under direct supervision of a staff obstetrician, for wives of enlisted men participating in the Emergency Maternity and Infant Care Program. The resolution declares that the program is placing an added strain on "already overtaxed medical service facilities" in the community and points out that the use of the clinic will in no way interfere with patients employing their own private physicians. Practicing physicians with requisite hospital privileges may refer patients to the private antepartum clinic. They will receive a complete report of the history, physical and laboratory results,

and the referring physician or his associate must be in attendance at the delivery. A list of participating physicians who are approved for obstetric practice in the hospitals shall be available at the city of Dayton and the Montgomery County Health departments. In the event that an applicant for care has no physician, she shall be privileged to select a physician from the prepared list. If no selection is made, she shall be referred by the health department to the hospital private antepartum clinic of her choice, and the attending staff obstetrician on duty shall make the necessary arrangement for her care. The resolution affirms the agreement of the society with the apparent purpose of the Emergency Maternity and Infant Care Program, namely to offer assistance to the wives and children of boys in the armed forces, to record its disagreement with the method of application, viewing with alarm the "spread of bureaucracy in any field."

PENNSYLVANIA

Tuberculosis Fellowships Awarded.—The Pennsylvania Tuberculosis Society awarded scholarships to Drs. Philip L. Rettew, Morgantown, and Thomas G. McQueen, Mifflingburg. The scholarships will enable the physicians to participate in a postgraduate course in the Trudeau School of Tuberculosis at Saranac Lake, N. Y. Usually only one award is made by the society, but this year two were presented; the Trudeau School made one award available. Dr. Rettew graduated at the University of Pennsylvania School of Medicine, Philadelphia, in 1941 and Dr. McQueen at the University of Cincinnati College of Medicine in 1929.

Philadelphia

Ophthalmic Postgraduate Conferences.—On November 4 the eye section of the Philadelphia County Medical Society started a series of postgraduate conferences with Drs. Alfred Cowan and Sidney L. Olsho discussing "The Diagnosis of Corneal Diseases" and "Practical Points in the Refraction of the Eye" respectively. Others in the series include:

Drs. Wilfred E. Fry, Pathology and Corneal Diseases, and Isaac S. Tassman, The Newer Technics in Ocular Refraction, December 16.
Drs. George F. J. Kelly, Practical Points Pertaining to Perimetry, and Edmund B. Spaeth, Intraocular Foreign Bodies, January 20.
Drs. Walter I. Lillie, Retrobulbar Neuritis, and James S. Shipman, Rationale of the Use of Sulfa Drugs in Ophthalmology, February 17.
Drs. Francis H. Adler, Effect of the War Gases on the Eye, and Louis Lehrfeld, Treatment of Glaucoma, March 16.

Annual Dinner of Ex-Resident and Resident Physicians.—The fifty-seventh annual dinner of the Association of Ex-Resident and Resident Physicians of the Philadelphia General Hospital will be held on December 7 at the Warwick Hotel with Lieut. Comdr. Thomas F. Duhigg (MC), U. S. Navy, retired, president of the association, presiding. Dr. William Pepper, dean of the University of Pennsylvania School of Medicine, will be the guest of honor. Other guests will be Capt. Joseph A. Biello (MC), U. S. Navy, Mayor Bernard Samuel, Col. Samuel S. Creighton, M. C., U. S. Army, retired, Col. Henry Beeuwkes, M. C., A. U. S., Capt. Abraham H. Allen (MC), U. S. Navy, Dr. Hubley R. Owen, director of health of the city, Dr. William G. Turnbull, superintendent of the Philadelphia General Hospital, Dr. Herbert M. Goddard, coroner for the county of Philadelphia, and Dr. Frank M. Cline. Ex-residents who do not receive notices of the annual dinner are requested to send their correct addresses to the secretary, Dr. George Wilson, 133 South 36th Street.

County Society Resumes Examinations of Members.—The Commission on Physicians' Health, appointed by the Philadelphia County Medical Society in 1941, recently decided to revive its program to hold periodic health examinations of its members. This activity was temporarily discarded in the spring because of the number of physicians of the vicinity who are in the armed forces and because of the death of the chairman of the commission, Dr. James Alexander Clarke Jr. Dr. Myer Solis-Cohen is the new chairman of the commission. *Philadelphia Medicine*, official bulletin of the society, on October 23 carried an announcement outlining the objectives of the program as follows: to preserve the health of each member, to set an example for one's patient and to the public, thereby stimulating periodic physical examinations among them, to find out more about the early beginnings of disease and to prevent illness. Groups of qualified physicians in every branch of medicine will examine members of the society periodically at no expense to those examined, the results to be kept in strict professional confidence. It was pointed out, however, that the investigation will be undertaken only if a sufficient number of physicians register to make it a worthwhile scientific contribution to medical knowledge.

TEXAS

Ordinance Provides Dogs for Baylor University.—On September 29 the city council of Houston passed an ordinance "directing that all dogs taken up and impounded and not redeemed or purchased as provided for in said ordinance shall be delivered to the Baylor University College of Medicine, Houston, in such numbers as requested by the college for use in the educational and research program of the college." The action was said to be taken after some opposition had been shown concerning the disposition of these animals to the college of medicine.

WEST VIRGINIA

Refractory Tuberculosis Patients to Be Detained.—The Public Health Council of West Virginia at a meeting in Charleston, October 25-27, went on record as defining tuberculosis contagious and subject to quarantine and requested the board of control to take the necessary steps for the detention in the state tuberculosis sanatoriums of "refractory or rebellious patients." It was brought out at the meeting that a number of patients had already left one of the state institutions prematurely, against the advice and without the consent of the members of the staff, to accept work in nearby defense plants. The action was taken by the public health council after the attorney general had ruled such a step legal.

Health Council Reduces Internship.—The public health council, cooperating with the federation of state licensing boards, has reduced the period of minimum internship required by licensure from twelve to nine months. The action was taken at Charleston, October 25-27. The council, in the resolution, declined to accept the recommendation of the council of the West Virginia State Medical Association that temporary permits to practice medicine be granted for the duration to graduates of unrecognized schools in order that medical care might be provided in certain areas where a doctor shortage is found to exist (THE JOURNAL, October 23, p. 497). The council felt that the legal difficulties involved would render the successful operation of such a plan impossible. The state medical association recommendation made it clear that such a permit granted would be revoked absolutely not later than six months after the cessation of hostilities. The council will meet in Charleston, January 3-5, to examine applicants for licensure.

PHILIPPINE ISLANDS

Dr. Whitacre Repatriated.—Dr. Frank E. Whitacre, professor and head of the department of gynecology and obstetrics at Peiping Union Medical College, Pekin, China, is reported to be repatriated on the *Gripsholm* arriving in New York about December 2. Dr. Whitacre has been interned by the Japanese since 1942. He was formerly associated with the Chicago Lying-In Hospital of the University of Chicago and the Tennessee State Medical Association in connection with the Commonwealth Fund postgraduate education program.

GENERAL

Special Society Elections.—Dr. Claude W. Munger, medical director of St. Luke's Hospital, New York, was named president-elect of the American College of Hospital Administrators at its meeting in Buffalo in September. Dr. Robert H. Bishop Jr., medical director of the University Hospitals, Cleveland, was installed as president.——Dr. John J. Sippy, county health officer, San Joaquin County, Stockton, Calif., was in October named president-elect of the American Public Health Association and Dr. Felix J. Underwood, secretary of the state board of health, Jackson, Miss., was installed as president.

Compulsory Premarital Physical Examinations for Tuberculosis.—No states require a premarital physical examination for tuberculosis, according to the *Bulletin* of the National Tuberculosis Association. Three states, Washington, North Carolina and North Dakota, have legislation which prevents persons from marrying who have infectious tuberculosis, and three other states, Delaware, Indiana and Pennsylvania, have general laws covering the marriage of persons with a transmissible disease. Tuberculosis is not specified in these laws, it was stated, but would be covered by the term "transmissible."

Academy of Tropical Medicine.—The American Academy of Tropical Medicine will meet in Cincinnati, November 17, at the Gibson Hotel. Lieut. Col. Thomas T. Mackie, M. C., A. U. S., will act as toastmaster at the association's tenth annual dinner. Dr. Lewis W. Hackett, Buenos Aires, Argentina, will deliver his presidential address on "The South American Scene." Dr. Charles F. Craig, San Antonio, Texas, will

be awarded the Theobald Smith Gold Medal of the George Washington University School of Meuicine, Washington, D. C., at this session, the presentation to be made by Dr. Herbert C. Clark, Panama, Republic of Panama.

Schering Prizes for Undergraduate Study.—"Hormones and Cancer" is the theme of the third nationwide competition for the Schering Award, three major prizes of a total value of $1,000 going to the undergraduate medical students who submit the best critical dissertations on the subject. The Schering Award was established by the Schering Corporation in 1941 for the purpose of encouraging a wider interest in current endocrinologic developments among undergraduate medical students. The competition is sponsored and administered by the Association of Internes and Medical Students, and participation is limited to undergraduate medical students in the United States and Canada. All manuscripts must be submitted not later than Jan. 15, 1944. Communications should be addressed to "The Interne," 7 East 42d Street, New York 17.

Borden Award in Nutrition.—The American Institute of Nutrition announces that nominations are now being received for the Borden Award in Nutrition, given in recognition of distinctive research by investigators in the United States and Canada, which has emphasized the nutritive significance of the components of milk or of dairy products. The award will be made primarily for the publication of specific papers, but the judges may recommend that it be given for important contributions over an extended period of time. The award may be divided between two or more investigators. Employees of the Borden Company are not eligible for this honor. To be considered for the award, nominations must be in the hands of the chairman of the nominating committee, Henry A. Mattill, Ph.D., University of Iowa, Iowa City, by Feb. 1, 1944. The nominations should be accompanied by such data relative to the nominee and his research as will facilitate consideration for the award.

National Malaria Society.—The National Malaria Society will meet at the Gibson Hotel, Cincinnati, November 16-18. A joint session of the society with the American Society of Tropical Medicine, Thursday, will consist of a symposium on "A National Program for the Control of Malaria." Included among the speakers on the program will be:

Dr. Felix J. Underwood, Jackson, Miss., Malaria Prevention Activities of State Boards of Health.
Dr. Lewis W. Hackett, Buenos Aires, Argentina, Spleen Measurement in Malaria and Its Recording.
C. W. Kruse, assistant engineer, A. D. Hess, malariologist, and R. L. Metcalf, assistant entomologist, Tennessee Valley Authority, Wilson Dam, Ala., Airplane Dusting for the Control of Anopheles Quadrimaculatus on Impounded Waters.
James C. Andrews, Ph.D., and William E. Cornatzer, S.M., Chapel Hill, N. C., The Absorption of Quinine Salts from Isolated Intestinal Loops of Dogs.

Brig. Gen. James S. Simmons, M. C., U. S. Army, will deliver his presidential address, Thursday, on "American Mobilization to Combat Wartime Hazards of Malaria."

Society of Tropical Medicine.—The American Society of Tropical Medicine will meet in Cincinnati, November 15-18, at the Gibson Hotel. Among the speakers will be:

Dr. Clarence A. Mills and Esther S. Cottingham, M.T., Cincinnati, Influence of Vitamin Intake on Phagocytic Activity.
Dr. Harold W. Brown, Thomas J. Brooks Jr., M.S., and Emanuel Waletsky, Ph.D., Chapel Hill, N. C., The Treatment of Canine Heartworm (Dirofilaria Immitis) with Anthiomaline.
Dr. Henry Hanson, Jacksonville, Fla., Malaria in High Altitudes.
Dr. Herbert C. Clark, Panama, Republic of Panama, The Age Level for the Peak of Acquired Immunity to Malaria as Reflected by Labor Forces.
Dr. Damaso de Rivas, Philadelphia, Amebiasis of the Uterus.
Drs. Ira Muir Clapper and Gordon B. Myers, Detroit, The Protean Manifestations of Weil's Disease.

Col. George R. Callender, M. C., U. S. Army, will deliver the eighth Charles Franklin Craig Lecture on Tropical Medicine, entitled "Diarrheal Diseases." Dr. Noel Paul Hudson, Columbus, Ohio, will deliver his presidential address on "A Broader Perspective for Bacteriology" at the annual luncheon on Wednesday.

Industrial Hygiene Personnel.—On August 4 recommendations concerning the assignment of industrial hygiene personnel were adopted by the sanitary engineering committee which will allow each state with an industrial population of less than 500,000 one industrial hygiene engineer, states with 500,000 or more workers two such engineers, and one such industrial hygiene engineer for each additional 500,000 workers. The action stemmed from resolutions presented at the War Conference on Industrial Health in Rochester, N. Y., in May, which urged that consideration be given to the present shortage of industrial hygiene personnel. At a meeting in Washington in July J. J. Bloomfield, senior sanitary engineer, division of industrial hygiene, National Institute of Health, Bethesda, Md., stated that there is a total of 257 professional industrial hygiene personnel in all of the state and local units, of whom 59 are officers on loan from the public health service. The problem of securing engineers and chemists was the major need considered at this meeting, since there are only 187 now in service in these units. It was pointed out that the loss of even one man from the division of industrial hygiene in most states would seriously jeopardize the program. Under the new setup the procurement and assignment service for sanitary engineers of the War Manpower Commission will now operate under its new definition of essentiality, so that only those engineers declared available under the new definition of essentiality would be permitted to accept a commission in any one of the services. It is felt that the statistical basis used, which allots a certain number of engineers according to the size of the labor force in each state, should work no hardship on any industrial area, with one exception. This exception is the county of St. Louis, and the committee felt that rather than complicate its new simple definition, and since only one place was involved, it would give favorable consideration to making an exception in the case of St. Louis County, allowing the county to have one industrial hygiene engineer in addition to the chief sanitary engineer already allowed under the original ruling. It would seem, therefore that the engineering personnel now operating in the various state and local industrial hygiene units have fair assurance that they will continue at their present posts, at least as far as the industrial hygiene engineering needs of the war agencies are concerned. The army, navy and public health service and maritime commission are at present not recruiting any additional personnel in the field of industrial hygiene engineering, but in the future should any one of these need additional personnel of this type such personnel would have to clear first through the procurement and assignment service for sanitary engineers of the War Manpower Commission.

Nutritional Research Program.—The National Live Stock and Meat Board has announced that it will support the following research program for the 1943-1944 period:

Dr. Paul R. Cannon, chairman, department of pathology, University of Chicago School of Medicine, The Influence of Dietary Protein on the Regeneration of Blood Proteins and the Resulting Capacity to Fabricate Antibodies.
Conrad A. Elvehjem, Ph.D., professor of biochemistry, and Frank M. Strong, Ph.D., associate professor of biochemistry, University of Wisconsin, Madison, Investigation of the Amino Acid Content of Meats.
Dr. Elvehjem, The Vitamin Content of Meats and the Nutrition of Vitamins During Cooking.
Ruth M. Leverton, Ph.D., associate professor of human nutrition research, University of Nebraska, Lincoln, Blood Regeneration in Women Blood Donors.
Evelyn G. Halliday, Ph.D., associate professor of food and food chemistry, and Winifred F. Hinman, M.S., instructor in food chemistry, University of Chicago, Retention of B Vitamins in Braising Beef.
Sylvia Cover, Ph.D., foods specialist, and Paul B. Pearson, Ph.D., professor of animal nutrition, experimental station, Agricultural and Mechanical College of Texas, College Station, Retention of B Vitamins During the Roasting of Meat.
George O. Burr, Ph.D., professor and director, division of physiologic chemistry, University of Minnesota, Minneapolis, Fat Metabolism and Essential Unsaturated Fatty Acids.
Dr. Arild E. Hansen, associate professor of pediatrics, University of Minnesota Medical School, Minneapolis, Fat Metabolism in Relation to Human Nutrition.
Paul L. Day, Ph.D., professor of physiologic chemistry, University of Arkansas School of Medicine, Little Rock, Nutritional Cytopenia and Vitamin M in the Nutrition of the Monkey and Related Studies.

Baruch Committee on Physical Medicine.—On October 30 the first meeting of the Baruch Committee on Physical Medicine was held in New York. Officers chosen at the session include Dr. Ray Lyman Wilbur, chancellor, Stanford University, Calif., chairman, William T. Sanger, LL.D., president of the Medical College of Virginia, Richmond, vice chairman, and Dr. Frank H. Krusen, medical director of the School of Physical Medicine, Mayo Clinic, Rochester, Minn., director-secretary. Other members of the committee are Dr. John S. Coulter, Chicago, Dr. Kristian G. Hansson, New York, Dr. Carl R. Comstock, Saratoga Springs, N. Y., Capt. Charles F. Behrens (MC), U. S. Navy, and Lieut. Col. Benjamin A. Strickland Jr., M. C., U. S. Army. Nine special committees and their respective chairmen were appointed as follows:

Occupational Therapy, Dr. Hansson.
Poliomyelitis, Dr. Wilbur.
Basic Research, Dr. Sanger.
Clinical Research, Dr. Coulter.
Publicity, Dr. Wilbur.
Hydrology and Health Resorts, Dr. Comstock.
Prevention, Dr. Hansson.
Teaching, Dr. Krusen.
Rehabilitation, Captain Behrens.

The main office for the Baruch Committee on Physical Medicine will be at 597 Madison Avenue, New York. The activities of the various committees will constitute a survey of the field of physical medicine to determine its potentialities, ending, it is proposed, in the establishment of a school of physical therapy for its study and teaching (THE JOURNAL, November 6, p. 648).

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 25, 1943.

The President of the British Medical Association

The vacancy created by the sudden death of Sir Beckwith Whitehouse, president of the British Medical Association, has been filled by the appointment of Lord Dawson, a former president, who held office at the centenary meeting of 1932. This reappointment of a president is unprecedented. Not only is Lord Dawson a leading consultant, but he has an unequaled command of medical politics.

In his address on assuming the presidency of the association Lord Dawson said that, in the shaping and organizing of the proposed new medical service, doctors must have an important voice. Changes would be deep and fundamental and would affect all members of the profession; no other nation comparably placed had undertaken so big an endeavor. The service must be built in stages. If properly designed, its administrative direction would not interfere with the freedom of the profession, and the minister had promised that the medical profession would have a large share in such administration. He thought that the local administrative body should be a joint board embracing several major local authorities with vocational advisory bodies attached. We wanted the same essential service for all, namely the best, but without dull uniformity. A comprehensive service, free to all citizens, did not necessarily involve a full time salaried service for all doctors, nor was it necessarily incompatible with private practice. Although he believed that more earnings in the future would be derived from salary and less from fees, Lord Dawson said, he was far from convinced that any uniform system of service or payment would meet conditions so multifarious as those attaching to medical practice, and any emergence of official and nonofficial groups of doctors would, in his opinion, be disastrous. He recalled one of the evil consequences of the fact that the Ministry of Health did not accept the advice of leaders of the profession in 1929. This was responsible for the existence of two sets of hospitals and two groups of doctors in many towns. If the ministry had accepted the profession's advice and instituted machinery for progressive coordination of local government and voluntary services, we would be much nearer our goal today.

Remarkable Health of British Troops in the War

In his Ludwig Mond lecture at Manchester University Sir Edward Mellanby stated that in this war the health of the British navy, army and air force had been so good as to represent a remarkable achievement. He contrasted this war with Napoleon's invasion of Russia and the French expedition to the Crimea, in which the losses due to illness exceeded those due to wounds and often were more than half the number of soldiers engaged. But even the Eighth Army during its three years in Egypt, Libya and Tunisia, where it has been fighting under conditions ideal for the development of dysentery, typhoid, cholera, smallpox and typhus, has been conspicuously free from disease. Protection by inoculation against typhoid, paratyphoid, cholera, smallpox, tetanus and yellow fever was given to troops before leaving this country. This protection has proved most effective. Much greater protection has been given to our troops by typhoid vaccination than the Italians and Germans have given to theirs. This is reflected in the high rate of these diseases among Italian and German prisoners in our hands as compared to that among our men who were prisoners of the Italians. When the Italian and German prisoners were inoculated with our vaccine, typhoid fever ceased abruptly, and thereafter the endemic rate remained low. Our T. A. B. vaccine made from strains rich in the Vi antigen proved much more effective than the Italian vaccine made from nonvirulent strains. The Vi antigen was a discovery of a British research worker. The incidence of dysentery, even in the fly swarming western desert, remained relatively low among British troops, and those affected reacted well to recently discovered drugs. The incidence of tetanus among British troops in the Middle East was 0.013 per cent whereas in the South African force, in which active immunization had not been carried out, the incidence was 0.16 per cent—twelve times greater. The incidence of dysentery in the western desert also remained low among British troops and those affected responded well to modern treatment. On the other hand, the incidence among Germans and Italians was much higher. It was said that our success at El Alamein was partly due to the enfeeblement of enemy troops by widespread dysentery. Our success in controlling disease was partly due to recent research, for which our medical scientists have not received due credit.

"The Running Ear" and the Ruptured Drum in the Army

Men with disorders of the ear are so numerous in the army that the *Army Medical Department Bulletin* publishes the recommendation that every case of the sort should be assessed by an otologist, so that the medical officer may know its exact nature and appropriate treatment. Otologists are requested to classify chronic otitis media as active, quiescent or healed. Broadly speaking, patients with active otitis media need treatment and are fit only for home service; quiescent otitis media needs prophylactic measures and these patients should usually be placed in category B or C. Healed otitis media should be categorized according to the standard of healing. The vast majority of soldiers with discharging ears can be suitably employed in the army. Meticulous cleansing of the external auditory meatus is important. As a rule the ears are best kept dry by insufflation of boric acid and iodine or sulfonamide powder.

Every medical officer should know how to prevent infection of the middle ear when the drum is ruptured. A high proportion (50 per cent) of those injured by blast sustain rupture of the drum. In many this is overlooked because of absence of symptoms or because of more serious wounds. If there is the least chance that the drum has been injured, no drops of any description should be permitted to enter the ear, and on no account should the ear be washed out with a syringe. No manipulations, except under complete asepsis, should be made in the meatus, which must be protected by a sterile dressing of cotton wool. The patient should be told not to blow his nose. If infection of the ear is anticipated, the prophylactic sulfonamide should be given by mouth, and the patient should be seen by the otologist.

Marriages

PAUL CALVIN JENKS, Burlington, Vt., to Miss Patricia Bickelhaupt of Hammond, N. Y., in New York, September 25.

NATHANIEL ROSCOE SPENCER, Washington, D. C., to Miss Barrier Mae Walsworth of Monroe, La., October 23.

NORMAN W. RAUSCH, Orange, N. J., to Miss Adele D. Hinklemann of West Hartford, Conn., in August.

RUFUS HENRY ALLDREDGE, New Orleans, to Miss Mary Elizabeth Barrett at Hammond, La., October 30.

BENJAMIN FRANKLIN LEVY to Miss Joyce Ann Cantor, both of Syracuse, N. Y., in Ithaca, September 18.

GEORGE WILLCOX BROWN, Marietta, Ga., to Miss Betty Andrews of Augusta, September 4.

WARREN FRANCIS SMITH, Oak Park, Ill., to Miss Barbara O'Malley of Chicago recently.

HERMAN GLADSTONE, Chicago, to Miss Madge Willstatter of New York, October 17.

Deaths

Wright Clarkson ● Petersburg, Va.; Medical College of Virginia, Richmond, 1912; Army Medical School, 1918; specialist certified by the American Board of Radiology, Inc.; member of the House of Delegates of the American Medical Association 1935, 1936, 1938, 1939 and 1940; member of the American Roentgen Ray Society, Radiological Society of North America, Inc., American College of Radiology, American Radium Society, Southern Medical Association, and the Petersburg Medical Faculty; past president of the American Association for the Study of Neoplastic Diseases; a founder and president of the Virginia Radiological Society; served as vice president of the Tri-State Medical Association of the Carolinas and Virginia; a founder of the Fourth District Medical Society and chairman of its steering committee; served in the medical corps of the U. S. Army during World War I; in 1920 chief of x-ray service at the General Hospital number 41, New York; a lieutenant commander in the medical corps, U. S. Naval Reserve; on the staffs of the John Randolph Hospital, Hopewell, Petersburg and Central State hospitals; founder and president of the Virginia Cancer Foundation; trustee of the Southern College; radiology editor, *Southern Medicine and Surgery;* died in the Garfield Memorial Hospital, Washington, D. C., October 17, aged 53, of leukemia.

Frank William Howard Taylor, Los Angeles; College of Physicians and Surgeons, Los Angeles, 1917; also a lawyer; member of the California Medical Association; instructor in x-ray and electrotherapy at the University of Southern California, 1919-1920; instructor in military x-ray and chief roentgenologist, medical corps, U. S. Army, and later lieutenant commander in the U. S. Naval Reserve during World War I; roentgenologist at the Clara Barton, French, Angelus and Roosevelt hospitals, Pottenger Sanitarium and the Veterans Administration Facility, Sawtelle, from 1919 to 1929; vice president of the Taylor Holding and Investment Corporation; medicolegal consultant and medical director of the Southwest X-Ray and Clinical Laboratories; author of "Lawyers' Text and Atlas of the Human Body"; died July 2, aged 52, of coronary thrombosis.

Wilson Johnson ● Portland, Ore.; Kentucky School of Medicine, Louisville, 1892; associate clinical professor of ophthalmology at the University of Oregon Medical School; specialist certified by the American Board of Ophthalmology and the American Board of Otolaryngology; member of the House of Delegates of the American Medical Association in 1911; member of the American Academy of Ophthalmology and Otolaryngology, Western Ophthalmological Society and the Pacific Coast Oto-Ophthalmological Society; past president of the Oregon and Washington state medical societies; formerly a member of the Washington State Board of Health; fellow of the American College of Surgeons; served during World War I; chairman for the procurement and assignment service; on the staff of the Coffey Memorial Hospital; died in Multnomah August 15, aged 75, of coronary thrombosis.

Robert Jesse Reynolds, Potsdam, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1915; member of the Medical Society of the State of New York; secretary of St. Lawrence County Medical Society; served on the Mexican border in 1916 and as a captain in the medical corps of the 27th division in France during World War I; member and examining physician for draft board number 412; secretary of the staff of the Potsdam Hospital; on the staff of the Stephen B. Van Duzee Hospital, Gouverneur, and the Massena Memorial Hospital; a director of the Citizens National Bank and emergency medical director of St. Lawrence County War Council; died in Madrid August 14, aged 52, of coronary thrombosis.

Edgar Cannon Armstrong, Laurel, Miss.; University of Nashville (Tenn.) Medical Department, 1908; member of the Mississippi State Medical Association; died August 29, aged 61.

John T. Bogard, Mena, Ark.; Memphis (Tenn.) Hospital Medical College, 1899; died August 20, aged 72.

Charles William Bower, Lehighton, Pa.; University of Vermont College of Medicine, Burlington, 1879; University of Pennsylvania Department of Medicine, Philadelphia, 1880; died August 29, aged 88, of senility.

Charles F. Brady, Parsons, Kan.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1903; died August 13, aged 65, of coronary occlusion.

Charles E. Caswell, Wichita, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1902; member of the Kansas Medical Society; died recently, aged 73, of cerebral thrombosis and arteriosclerosis.

Frederick J. Champney, North Baltimore, Ohio; Detroit College of Medicine, 1893; died in Findlay August 17, aged 76, of pneumonia.

William H. Chapman ● Blythe, Calif.; University of Nebraska College of Medicine, Omaha, 1902; member of the city council, school board and chamber of commerce; physician for Riverside County and the Santa Fe Railroad; died in the Loma Linda Sanitarium and Hospital August 19, aged 66, of bronchopneumonia and hypertension.

Stephen Reaves Coleman, Washington, D. C.; University of Texas School of Medicine, Galveston, 1917; on Sept. 7, 1942 commissioned a major in the medical corps, Army of the United States, not on active duty; served during World War I; associated with the Veterans Administration; on the staff of the Veterans Administration Facility; past president of the District of Columbia Urological Society; died August 30, aged 55, of hypertension.

Louis Joseph Cooke, Minneapolis; University of Vermont College of Medicine, Burlington, 1894; director of athletics at the University of Minnesota; formerly physical director of the Y. M. C. A. at Toledo, Ohio, Duluth, Burlington, Vt., and Minneapolis; on the staff of the University Hospitals; died August 19, aged 75, of hypertension.

Willis Hiram Corson, Seattle; Cooper Medical College, San Francisco, 1905; member of the Washington State Medical Association; served with the Italian army during World War I; awarded the Italian Cross of Honor and a Chevalier of the Crown in recognition of exceptional service to the Italian people; formerly coroner of King County; at one time medical superintendent of the King County Hospital; died August 19, aged 64, of carcinoma of the larynx.

Robert Duval Cousins, Beaumont, Texas; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1902; died August 26, aged 68, of typhus and pneumonia.

Omar Legrand Cox ● Iola, Kan.; Cotner University Medical Department, Lincoln, Neb., 1894; secretary and past president of the Allen County Medical Society; a captain in the medical corps of the U. S. Army during World War I; member of the State Board of Medical Registration and Examination; on the staff of St. John's Hospital; died in the Veterans Administration Facility, Wichita, August 22, aged 76, of heart disease.

Mary Gamble Cummins, Oak Bluffs, Mass.; the Hahnemann Medical College and Hospital, Chicago, 1893; at one time a member of the board of education of Paterson, N. J.; died August 20, aged 73.

Emory S. Deaver, Monroe, Ga.; Hospital Medical College, Atlanta, 1911; died August 25, aged 65, of heart disease.

William Emmett Denman, Greenwood, Miss.; Memphis (Tenn.) Hospital Medical College, 1907; member of the Mississippi State Medical Association and the American College of Chest Physicians; on the staff of the Greenwood-Leflore Hospital; died August 28, aged 61, of coronary occlusion.

Edwin Strassbridge English, Brevard, N. C.; University of the South Medical Department, Sewanee, Tenn., 1900; past president of the Transylvania County Medical Society; member of the Medical Society of the State of North Carolina; on the staff of the Transylvania Community Hospital; died August 19, aged 75, of coronary thrombosis.

Charles Henry Gardner ● Senior Surgeon, U. S. Public Health Service, retired, Baltimore; Columbian University Medical Department, Washington, D. C., 1890; entered the U. S. Public Health Service on Jan. 28, 1892; died in the U. S. Marine Hospital August 10, aged 78, of coronary thrombosis.

Eugene John Gay, French Camp, Calif.; Drake University Medical Department, Des Moines, 1897; member of the California Medical Association; on the staff of the San Joaquin General Hospital, where he died recently, aged 72, of rheumatic heart disease.

David Arnold Goldman, St. Louis; St. Louis University School of Medicine, 1935; member of the Medical Association of Georgia; began extended active duty as a first lieutenant in the medical reserve corps of the U. S. Army on Nov. 5, 1940; honorably discharged Aug. 17 1941; died in the Frisco Employes' Hospital August 25, aged 35, of multiple polyposis carcinoma.

Frank Starr Gregory ● Redwood City, Calif.; Cooper Medical College, San Francisco, 1900; past president of the San Mateo County Medical Society; head of the Selective

Service Board; at one time mayor of Pittsburg; on the staff of the Mills Memorial Hospital, San Mateo, where he died August 21, aged 68, of myocardial infarction.

Paul Lee Hammond, Bradley, Ark.; St. Louis College of Physicians and Surgeons, 1917; Kansas City (Mo.) College of Medicine and Surgery, 1921; died August 5, aged 53.

John Windsor Harbarger, Jackson, Ohio; Kentucky School of Medicine, Louisville, 1892; a captain in the medical corps of the U. S. Army during World War I; died in the Veterans Administration Facility, Huntington, W. Va., August 27, aged 76, of heart disease.

Henry Winston Harper ● Austin, Texas; University of Virginia Department of Medicine, Charlottesville, 1892; also a pharmacist and lawyer; teacher of chemistry at the University of Texas from 1894 to 1943 and dean of the graduate school from 1913 to 1936; died in the Seton Hospital August 28, aged 84.

Charles Lewis Haywood Jr. ● Elkin, N. C.; Harvard Medical School, Boston, 1927; diplomate of the National Board of Medical Examiners; fellow of the American College of Surgeons; medical director of the Hugh Chatham Memorial Hospital; died August 22, aged 40, of coronary thrombosis.

Joseph Marion Heard, Aberdeen, Miss.; Long Island College Hospital, Brooklyn, 1890; died August 25, aged 89, of intestinal hemorrhage.

Frederick Eric Hellbaum, Bakersfield, Calif.; Stanford University School of Medicine, San Francisco, 1935; commissioned a captain in the medical corps, Army of the United States, Sept. 2, 1942 and honorably discharged Jan. 16, 1943; served as resident physician at the Kern General Hospital; on the staff of the Mercy Hospital, where he died September 4, aged 41, of coronary occlusion.

Robert Wing Hemingway ● Bend, Ore.; Rush Medical College, Chicago, 1925; also a pharmacist; fellow of the American College of Surgeons; member of the staffs of St. Charles and Lumbermen's hospitals; died August 27, aged 48, of coronary thrombosis.

Archibald Murphy Henry, Brownwood, Texas; Louisville (Ky.) Medical College, 1888; died July 1, aged 82.

Melvin K. Henry ● Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1893; formerly on the staff of the Frankford Hospital; died August 5, aged 72, of bronchial asthma and coronary thrombosis.

Wallace John Herriman, Rochester, N. Y.; University of the City of New York Medical Department, 1879; served as a surgeon, lieutenant commander in the U. S. Navy during World War I; died August 28, aged 85.

Albert James Hodgson, Waukesha, Wis.; Rush Medical College, Chicago, 1886; member of the State Medical Society of Wisconsin; formerly secretary of the Waukesha County Medical Society; awarded an honorary degree of doctor of science by Carroll College in 1916; died in the Summit Hospital, Oconomowoc, Wis., October 5, aged 84, of myocarditis.

Frederick F. Holroyd, Princeton, W. Va.; College of Physicians and Surgeons, Baltimore, 1910; member of the West Virginia State Medical Association; served during World War I; city health officer; chief physician for the Mercer County Jail; on the staff of the Mercer Memorial Hospital; died August 15, aged 57, of coronary thrombosis.

Jerry Morris Hyde ● Nelsonville, Ohio; Bellevue Hospital Medical College, New York, 1885; formerly examiner for several insurance companies; died August 26, aged 83, of cerebral hemorrhage.

George Tasker Imrie ● Rochester, N. Y.; Trinity Medical College, Toronto, Ont., Canada, 1902; member of the staff of the Park Avenue Hospital; died August 28, aged 71, of cerebral hemorrhage.

Oscar Lee Jones, Fort Worth, Texas; University of Louisville (Ky.) Medical Department, 1887; died in the Methodist Hospital August 21, aged 79, of heart disease.

Charles Wesley Larkins, Cincinnati; Eclectic Medical College, Cincinnati, 1918; advisory member of Selective Service Board number 29, Westwood; past president of the Westwood Athletic Club; died in the Bethesda Hospital August 28, aged 54, of hypertension.

Charles Buchanan Law, Mineral Wells, Texas; Memphis (Tenn.) Hospital Medical College, 1913; served during World War I; died in the Nazareth Hospital August 24, aged 59, of coronary disease.

Charles Leali, Kingsland, Ark.; Missouri Medical College, St. Louis, 1882; died July 29, aged 84.

Harry Hamilton Lewis, Louisville, Ky.; University of Louisville Medical Department, 1890; died August 7, aged 75, of carcinoma and arteriosclerosis.

Charles Day Lipscomb, Quitman, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1902; served as health officer of Wood County; died in August, aged 77.

Clifford Athenus Lutgen ● Auburn, Neb.; Lincoln Medical College of Cotner University, 1901; president of the Nemaha County Medical Society in 1936; president of the Nebraska Hospital Association in 1940; for many years a member of the city library board; member of the chamber of commerce; past president and charter member of the Auburn Kiwanis Club; medical director and owner of the Auburn Hospital; died August 15, aged 70, of virus pneumonia.

Will R. McCamy, Knoxville, Tenn.; Chattanooga Medical College, 1901; member of the Tennessee State Medical Association; died August 6, aged 66, of pneumonia.

Joseph Hamilton McLeskey, Charlotte, N. C.; University of Georgia Medical Department, Augusta, 1909; member of the Medical Society of the State of North Carolina; on the staffs of the Mercy and Presbyterian hospitals; died in Clemson College, S. C., August 4, aged 59, of coronary thrombosis.

Frederick Henry Martin, Libertyville, Ill.; the Hahnemann Medical College and Hospital, Chicago, 1899; a captain in the medical corps of the U. S. Army during World War I; died in the Veterans Administration Facility, Downey, August 18, aged 71, of chronic myocarditis and arteriosclerosis.

Paul Dickinson Maxwell, Utica, N. Y.; Syracuse University College of Medicine, 1938; member of the Medical Society of the State of New York; on the staff of the Rome State Hospital; died August 21, aged 31, of cerebral thrombosis.

Arthur S. Monzingo ● Gig Harbor, Wash.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1905; superintendent and owner of the Gig Harbor Hospital, where he died August 21, aged 66, of coronary thrombosis.

Charles Emory Morse ● La Junta, Colo.; Denver and Gross College of Medicine, 1909; president of the staff of Mennonite Hospital; died August 16, aged 63, of coronary thrombosis.

Edwin Smith Moss, Williamsburg, Ky.; Hospital College of Medicine, Louisville, 1881; member of the Kentucky State Medical Association; president of the First National Bank for thirty-five years; for fifty years served as medical referee for Whitley County; chairman of the county board of health; for many years local surgeon for the Louisville and Nashville Railroad; died August 23, aged 83, of senility.

John J. Moylan, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1882; for many years chief of staff of St. Mary's Hospital; on the staffs of the Germantown Dispensary and Hospital and St. Joseph's Hospital; attending physician at the Little Sisters of the Poor, Home for the Aged and the House of Good Shepherd; died August 2, aged 85.

Ralph Lyle Oppen, O'Neill, Neb.; University of Nebraska College of Medicine, Omaha, 1940; appointed a first lieutenant in the medical corps of the National Guard on Dec. 23, 1940, assigned to the medical detachment, 134th Infantry, Camp Joseph T. Robinson, Arkansas; on Feb. 1, 1942 appointed a captain in the medical corps, Army of the United States; honorably discharged, May 5, 1943 because of physical disqualification; died August 6, aged 33, of cardiac decompensation.

John Thomas Pattison, Langley, S. C.; University of Georgia Medical Department, Augusta, 1890; died in a hospital at Anderson August 19, aged 73.

Charles Elvie Peel, Watseka, Ill.; Barnes Medical College, St. Louis, 1906; formerly physician for the Illinois Central Railroad; died August 25, aged 74, of coronary thrombosis and bronchial asthma.

William Waldo Rambo ● Jefferson City, Mo.; Washington University School of Medicine, St. Louis, 1926; for many years physician and surgeon for the Missouri State Penitentiary; died August 9, aged 50, of cerebral hemorrhage.

George Lawrence Ramsey, Powhattan Point, Ohio; Ohio Medical University, Columbus, 1898; member of the Ohio State Medical Association; for many years president of the board of education; died in the City Hospital, Bellaire, August 29, aged 71.

Edgar Thomas Ray, New York; Columbia University College of Physicians and Surgeons, New York, 1906; chief medical officer of the city of New York fire department; served during World War I; died in Brooklyn August 27, aged 63.

Matthew Simpson Reay, Randolph, Utah; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; member of the Utah State Medical Association; member of the county Selective Service Board during World War I and II; died in the Caribou County Hospital, Soda Springs, Idaho, August 6, aged 63.

Edward Clifton Rinehart ● Struthers, Ohio; Ohio State University College of Medicine, Columbus, 1913; died in the Youngstown Hospital, North Side Unit, August 29, aged 56, of heart disease.

Isaac Burton Roberts, Llanerch, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1897; member of the Medical Society of the State of Pennsylvania; served overseas during World War I; school doctor in Haverford township for many years and adviser to the board of health; member of the staff of the Delaware County Hospital, Drexel Hill, where he died August 29, aged 68, of injuries received when the automobile in which he was driving was struck by a trolley car.

John William Rockafeller, Loch Arbour, N. J.; College of Physicians and Surgeons, New York, 1890; died August 22, aged 73, of chronic myocarditis and intestinal neoplasm.

Holbert A. Rogers, Jeffersonville, Ga.; Atlanta College of Physicians and Surgeons, 1909; died in the State Tuberculosis Sanatorium, Alto, August 7, aged 59, of tuberculosis.

Melville Erskine Rumwell, Palo Alto, Calif.; Cooper Medical College, San Francisco, 1895; formerly associate clinical professor of surgery at the Stanford University School of Medicine; one of the first appointees on the board of the state industrial accident commission and for many years served with the state compensation insurance fund; formerly visiting physician at the Crocker Home and medical director of the Olympic Club; died August 3, aged 70.

Charles T. Schrader, Bristow, Okla.; Hospital College of Medicine, Louisville, Ky., 1905; member of the Oklahoma State Medical Association; mayor of Bristow for three terms; on the staff of the Cowart-Sisler Hospital; died August 27, aged 64, of angina pectoris.

Edwin Forrest Sibley ● Kingston, N. Y.; Albany Medical College, 1903; served in the medical corps of the U. S. Army during World War I; on the staffs of Benedictine Hospital and the Kingston Hospital; died in the Albany Hospital August 24, aged 64, of general arteriosclerosis and coronary sclerosis.

Hans Eugen Simmel, Warren, Ohio; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1914; on the staff of the Warren City Hospital; died in Colorado Springs, Colo., August 23, aged 52, of peritonitis.

Emery Singer, Avenel, N. J.; University of Kolozsvar, Hungary, 1911; died in the General Hospital, Perth Amboy, August 23, aged 57, of coronary thrombosis.

R. B. Slater, Craig, Colo.; St. Louis College of Physicians and Surgeons, 1921; also a pharmacist; secretary of the school board; on the staff of the Solandt Memorial Hospital, Hayden; died in Jackson, Wyo., August 13, aged 52, of coronary thrombosis.

Harry Wilbur Smith, Norridgewock, Maine; Dartmouth Medical School, Hanover, N. H., 1900; member of the Maine Medical Association; school physician; library trustee; a member of the town advisory committee; on the staff of the Redington Memorial Hospital, Skowhegan; died August 19, aged 73, of cerebral hemorrhage.

Francis George Speidel ● Washington, D. C.; George Washington University School of Medicine, Washington, 1917; served in the U. S. Navy during World War I; member of the staffs of the George Washington University, Doctors, Eastern Dispensary and Casualty, Children's and the Central Dispensary and Emergency hospitals; died in Richmond, Va., August 30, aged 51, of acute myocarditis.

Sam Houston Spruiell, Gouldbusk, Texas; University of Texas School of Medicine, Galveston, 1907; died August 27, aged 66, of chronic myocarditis and chronic nephritis.

Zella White Stewart, Iowa City; Cornell University Medical College, New York, 1904; member of the American Association for the Study of Allergy; died August 4, aged 65, of cerebral hemorrhage and hypertension.

Alexander Williamson Stirling, Baldwin, Ga.; M.B., University of Edinburgh Faculty of Medicine, Scotland, 1880 and M.D. in 1887; member of the Medical Association of Georgia; fellow of the American College of Surgeons; formerly on the staffs of the Wesley Memorial Hospital, Presbyterian Hospital and Tabernacle Infirmary, Atlanta; died August 16, aged 85.

Bernhardt Kurt Stumberg, St. Charles, Mo.; Maryland Medical College, Baltimore, 1900; member of the Missouri State Medical Association; veteran of the Spanish American War and World War I; on the staff of St. Joseph's Hospital; medical director of the Lindenwood College; died August 20, aged 67, of coronary occlusion.

John Samuel Talley, Troutmans, N. C.; University of North Carolina School of Medicine, Raleigh, 1909; member of the Medical Society of the State of North Carolina; past president and vice president of the Iredell-Alexander Counties Medical Society; died in the Davis Hospital, Statesville, August 4, aged 63, of coronary occlusion.

Daniel Herman Tellman ● Passaic, N. J.; Columbia University College of Physicians and Surgeons, New York, 1923; on the staff of the Beth Israel Hospital; died in the Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York, August 26, aged 41, of acute leukemia.

Albert S. Thompson ● Mount Horeb, Wis.; Minneapolis College of Physicians and Surgeons, 1902; for many years local health officer; died in the Methodist Hospital, Madison, August 28, aged 65, of coronary thrombosis.

Charles Urban Thralls, Hymera, Ind.; Illinois Medical College, Chicago, 1903; member of the Indiana State Medical Association; on the staff of St. Anthony's Hospital, Terre Haute; died August 23, aged 64, of Hodgkin's disease.

Richard E. Timberlake, Youngsville, N. C.; Jefferson Medical College of Philadelphia, 1908; examiner for several insurance companies; died August 10, aged 64, of cerebral hemorrhage.

William S. Tyson, New Boston, Texas; University of Nashville (Tenn.) Medical Department, 1908; for several terms served as health officer of Bowie County; died recently, aged 57, of heart disease.

George King Wassell, Dallas, Texas; Northwestern University Medical School, Chicago, 1935; member of the State Medical Association of Texas; instructor in surgery at the University of Michigan Medical School, Ann Arbor, from 1936 to 1938; assistant in clinical surgery at Baylor University College of Medicine from 1938 to 1943; assistant in clinical surgery at the Southwestern Medical Foundation School of Medicine; dispensary surgeon, Baylor Hospital; died August 31, aged 33, of heart disease.

Walter Walton Watson, Philadelphia; Medico-Chirurgical College of Philadelphia, 1900; member of the Medical Society of the State of Pennsylvania; died August 13, aged 69.

Moses Weiss, New York; Deutsche Universität Medizinische Fakultät, Prague, Czechoslovakia, 1927; member of the Medical Society of the State of New York; formerly president of the Balneological Society of Saratoga Springs; died in the New England Baptist Hospital, Boston, August 8, aged 41, of recurrent carcinoma of the cecum with generalized metastases.

Arthur Henry Wilson, Indianapolis; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1907; served with the American Expeditionary Forces during World War I; lieutenant colonel in the medical reserve corps of the U. S. Army not on active duty; died August 3, aged 67, of hypertension.

James T. Windell, Louisville, Ky.; University of Louisville Medical Department, 1892; member of the American Urological Association; died August 8, aged 78, of carcinoma.

DIED WHILE IN MILITARY SERVICE

Robert Carl Badertscher, Bloomington, Ind.; Indiana University School of Medicine, Indianapolis, 1940; member of the Indiana State Medical Association; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on June 30, 1940; beginning extended active duty on July 2, 1941; commissioned a captain; flight surgeon with the second photographic charting squadron; died at Iquitos, Peru, in an airplane crash September 6, aged 27.

Eugene Winston Matlock ● Port Arthur, Texas; University of Texas School of Medicine, Galveston, 1922; past president of the Jefferson County Medical Society; fellow of the American College of Surgeons; member of the surgical staff at St. Mary's Hospital; began extended active duty as a lieutenant commander in the medical corps of the U. S. Naval Reserve, Sept. 7, 1942; formerly stationed at the U. S. Naval Hospital at Corpus Christi and the U. S. Naval Training School at Norman, Okla.; died in an airplane crash near Madisonville Feb. 16, 1943, aged 43.

Correspondence

UNILATERAL NEPHRECTOMY AND HYPERTENSION

To the Editor:—In THE JOURNAL, October 2, page 277, Weiss and Chasis rightfully infer from the failure of the removal of a chronic atrophic pyelonephritic kidney to lower the blood pressure of a patient with hypertension that the diseased kidney probably was not causally related to the hypertension. From the fact that the other kidney showed normal blood flow, glomerular filtration rate and maximal tubular excretory capacity, however, they conclude that the remaining kidney was not diseased or ischemic and therefore not responsible for the hypertension. That the remaining kidney was not ischemic is obvious, but that it "cannot be indicted for this failure" [of the nephrectomy to reduce the blood pressure in the patient] is not necessarily true.

The mechanism whereby constriction of the renal artery produces hypertension in experimental animals is still unsettled. Although a reduction in pulse pressure may be involved (Kohlstaedt, K. G., and Page, I. H.: Liberation of Renin by Perfusion of Kidneys Following Reduction of Pulse Pressure, *J. Exper. Med.* **73**:201 [Aug.] 1940), local anoxia appears not to be (Marienfeld, C. J., and Wakerlin, G. E.: The Effect of Sodium Cyanide on the Formation of the Pressor Substance of the Completely Ischemic Kidney, *Fed. Proc.* **2**:32 [March 16] 1943). The evidence for increased liberation of renin into the circulation is suggestive but inconclusive (Page, I. H.: Demonstration of the Liberation of Renin Into the Blood Stream from Kidneys of Animals Made Hypertensive by Cellophane Perinephritis, *Am. J. Physiol.* **130**:22 [July] 1940. Dell-oro, R., and Braun-Menendez, E.: Dosaje de renina en la sangre de perros hipertensos por isquemia renal, *Rev. Soc. argent. de biol.* **18**:65 [May] 1942), and the opposite view of a reduction in a postulated normal antipressor activity of the kidney has recently been stressed (Grollman, Arthur, and Rule, Colter: Experimentally Induced Hypertension in Parabiotic Rats, *Am. J. Physiol.* **138**:537 [March] 1943. Grollman, Arthur; Harrison, T. R., and Williams, J. R., Jr.: Experimental Renal Hypertension in the Rat, *ibid.* **139**:293 [June] 1943). In any event renal ischemia is not necessary, as was formerly thought. Thus there is excellent evidence that experimental renal hypertension can occur with normal renal blood flow, glomerular filtration and maximal tubular excretory capacity (Corcoran, A. C., and Page, I. H.: Renal Blood Flow in Experimental Renal Hypertension, *Am. J. Physiol.* **135**:361 [Jan.] 1942).

Moreover, recently moderate hypertension developed in 4 of our dogs following bilateral constriction of the renal arteries (Wakerlin, G. E.; Moss, W. G., and Goldberg, M. L.: Unpublished observations). Six to twelve months later one kidney was of normal or near normal size whereas the other was approximately two-thirds normal size. On the theory that the normal sized kidney was not contributing to the hypertension and possibly even exerting an antihypertensive effect, the larger kidney was removed in an effort to obtain a more pronounced hypertension. In each dog the blood pressure fell to a persistent near normotensive level. Other observations in our laboratory also point to the probability that a kidney which is rendered ischemic by renal artery constriction is less effective in producing a high level of chronic or benign (in contrast to malignant) experimental hypertension than one which maintains a normal or near normal blood flow after constriction.

The fact that unilateral nephrectomy has been successful in reducing the elevated blood pressure to normal in only 7 of 76 patients as quoted by Weiss and Chasis is not evidence against the possible involvement of the kidney directly or indirectly in the pathogenesis of essential hypertension but rather against the premature and sometimes misinterpreted application of incomplete laboratory results to pressing clinical problems. On the other hand, the numerous similarities between essential hypertension and experimental renal hypertension do not prove even a partial common pathogenesis. Only future work can determine whether essential hypertension is a generic classification, one group of which may be of renal origin.

Consequently, although the hypertension in the case reported by Weiss and Chasis may well not be on a renal basis, this possibility is not ruled out when the evidence presented is viewed in the light of recent experimental findings.

GEORGE E. WAKERLIN, M.D., Chicago.
Professor and Head, Department of Physiology,
Chicago Colleges, University of Illinois.

DIPHTHERIA MORTALITY—TYPHOID CARRIERS—POLIOMYELITIS IN PREGNANCY

To the Editor:—This is to commend you on the excellent editorial on "Diphtheria Mortality in the United States."

You call attention to the fact that Dr. J. C. Geiger of San Francisco has noticed a recent increase in deaths from diphtheria in older age groups. I though you would be interested to know that during this year, to date, out of seven deaths from diphtheria in Los Angeles five were of persons over 40 years of age. As there were 13 patients over 40 years of age this makes a specific mortality rate of 38 per cent. During 1942 there were 27 patients over 40 years of age with diphtheria and seven deaths, or a specific mortality rate of 26 per cent. It would seem that diphtheria is being overlooked in the older age groups.

It may also interest you to know that 9 of the last 10 typhoid carriers discovered by our investigator are grandmothers.

It is noted in the September 25 issue of THE JOURNAL that Drs. Harmon and Hoyne reported 2 cases of poliomyelitis complicating pregnancy. It is interesting that the symptoms given in both of these cases point to bulbar poliomyelitis. Of 4 pregnant women admitted to the Los Angeles County General Hospital with poliomyelitis during the last few months, 3 had bulbar poliomyelitis, 2 of whom died. Both of the latter 2 delivered normal children before they died.

GEORGE M. UHL, M.D., Los Angeles.
Health Officer.

VINCENT'S ANGINA OF THE TONSIL

To the Editor:—In reference to a report (THE JOURNAL, October 9, p. 341) titled "Treatment of Vincent's Angina of the Tonsil," Major C. S. Linton treats the gingival margins in the following manner: "When infection also was present about the gum margins, it was advised that the sulfathiazole tablet be moistened with a few drops of water to make a paste and this used to rub into the gum margins." In this preliminary report it is stated that the author in his search of the literature failed to find any use of sulfonamide drugs for this purpose. He also indicates that Spink in his book reports that sulfanilamides have been used in the treatment of Vincent's angina with no benefit from local administration.

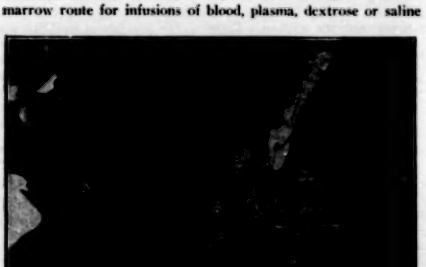
May I call to your attention the fact that I reported beneficial results in June 1942 (Sulfa Drugs in Local Treatment of Necrotic Gingivitis [Vincent's infection] *New York Journal of Dentistry* **12**:251 [June] 1942). I also reported them in Miller's Textbook of Periodontia (ed. 2, Philadelphia, Blakiston Company, 1943, chapter XVII). In both of these publications I indicated the use of a sulfonamide paste.

WILLIAM M. GREENHUT, D.D.S., New York.
Assistant Professor of Periodontia, New York University College of Dentistry.

STERNAL TRANSFUSIONS IN BURNS

To the Editor:—This communication is prompted by a quotation printed on page 815 of the July 17 issue of THE JOURNAL. The quotation is taken from a pamphlet entitled "Treatment of Burns and Prevention of Wound Infections," published by the Medical Division of the Office of Civilian Defense. In a discussion of the technic of administering plasma we are told that "it must never be administered by any other than the intravenous route."

The published reports on infusions via the bone marrow of Tocantins and O'Neill (THE JOURNAL, Oct. 11, 1941) and of Doud (*ibid.*, Dec. 12, 1942) testify to the feasibility of the bone marrow route for infusions of blood, plasma, dextrose or saline solution. This point bears emphasis because it is in just such cases of severe burns that superficial veins are apt to be either completely collapsed or involved in the burned area. Sternal bone marrow infusion presents an alternative route for fluid therapy. Plasma in such instances is life saving; and in that marrow infusion makes it available, marrow infusion is life saving.



Administration of plasma through infusion needle into bone marrow of sternum.

The procedure of sternal marrow infusion seems to be little known. Experience with it in war casualties has demonstrated its value and simplicity. The pamphlet quoted emphasizes the need for a rapid flow of a plasma infusion on occasion. A sternal infusion flows at a rate comparable to an intravenous infusion. The accompanying photograph illustrates our use of the procedure during the recent New Georgia campaign. The patient is a wounded Japanese prisoner.

SAMUEL L. LIEBERMAN,
First Lieutenant, M. C., A. U. S.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Nov. 6, page 655.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 20-22. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

CALIFORNIA: *Written.* San Francisco, Nov. 16-18. Sec., Dr. Frederick M. Scatena, 1020 N. St. Sacramento.

CONNECTICUT: * *Endorsement.* New Haven, Nov. 23. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven.

DELAWARE: *Written.* Dover, Jan. 11-13. *Endorsement.* Dover, Jan. 18. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA: * Jacksonville, Nov. 22-23. Sec., Dr. William M. Rowlett, Box 786, Tampa.

IDAHO: Boise, Jan. 11. Dir., Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Bldg., Boise.

IOWA: * Iowa City, Dec. 27-29. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Kansas City, Feb. 2-3. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, Dec. 6-8. Sec., State Board of Health, Dr. Philip E. Blackerby, 620 S. Third St., Louisville.

LOUISIANA: New Orleans, Dec. 21-23. Sec., Dr. R. R. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MARYLAND: *Medical.* Baltimore, Dec. 14-17. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 14-15. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 16-19. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MISSOURI: St. Louis, Nov. 15-17. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

NEW HAMPSHIRE: Concord, March 9-10. Sec., Board of Registration in Medicine, Dr. D. G. Smith, State House, Concord.

NEW JERSEY: Feb. 15-16. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW YORK: Albany, New York, Buffalo and Syracuse, Jan. 24-27. Sec., Dr. R. R. Hannon, Education Bldg., Albany.

NORTH CAROLINA: December. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 4-7. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Written.* Columbus, Dec. 13-15. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: * Oklahoma City, Dec. 27-29. Sec., Dr. J. D. Osborn Jr., Frederick.

PENNSYLVANIA: Philadelphia and Pittsburgh, January. Act. Sec., Bureau of Professional Licensing, Department of Public Instruction, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Charleston, Dec. 20-22. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA: * Pierre, Jan. 18-19. Dir., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, Pierre.

VERMONT: Burlington, Dec. 16-18. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, Dec. 14-17. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WISCONSIN: * Madison, Dec. 13-15. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, Dec. 21. Sec., Dr. R. L. Nugent, Science Hall, University of Arizona, Tucson.

NEW MEXICO: Feb. 7. Sec., Miss Pia Joerger, State Capitol, Santa Fe.

OKLAHOMA: Oklahoma City, Nov. 29. Sec., Dr. J. D. Osborn Jr., Frederick.

RHODE ISLAND: Providence, Nov. 17. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Building, Providence.

SOUTH DAKOTA: Vermillion, December. Sec., Dr. G. M. Evans, Yankton.

TENNESSEE: Nashville and Memphis, Dec. 10-11. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

WISCONSIN: Milwaukee, Dec. 4. Sec., Prof. Robert N. Bauer, 152 W. Wisconsin Ave., Milwaukee.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Right of Osteopath to Perform Minor Surgery.—Thierfelder, who was licensed to practice osteopathy in Montana, was charged in a criminal information with practicing medicine without a license in that on a stated day he performed a tonsillectomy on a stated patient. The trial court held, apparently, that the osteopath was not guilty of practicing medicine without a license, since a licensed osteopath could legally perform a tonsillectomy in Montana, and directed the jury to return a verdict in the osteopath's favor. The state then appealed to the Supreme Court of Montana.

A section of the Montana osteopathic practice act enacted in 1901 (Laws 1901, p. 50, sec. 6) read, in part, as follows:

> The certificate provided for in Section five of this Act shall not authorize the holder thereof to prescribe drugs in the practice of osteopathy, for (or) to perform major or operative surgery; And any person holding certificate under this Act, who shall prescribe or use drugs in the practice of osteopathy, or who shall perform major, *minor* or operative surgery, shall be deemed guilty of a misdemeanor; provided that nothing in this Act shall be so construed as to prohibit any legalized osteopath in this State from practising major or operative surgery after having passed a satisfactory examination in surgery before the State Board of Medical Examiners of the State of Montana.

In 1905 (Laws 1905, page 109) this section was amended by deleting or omitting the word "minor" italicized above. The osteopath contended that the legislature by omitting "minor" in the 1905 amendment clearly intended to permit osteopaths to practice minor surgery, impliedly arguing, of course, that the performance of a tonsillectomy was minor surgery. The Supreme Court, however, refused to adopt such logic. The omission of "minor," said the court, in the 1905 amendment was obviously done to clarify the section and to make it uniform wherever it referred to operative surgery. According to all medical authorities "operative surgery" includes both major and minor surgery and we have no doubt the legislative assembly believed the term "minor" was superfluous.

In 1907 the section of the medical practice act, in effect, defining the practice of medicine was amended (Laws 1907, chapter 101) by adding the following proviso:

> Provided, however, that nothing in this section shall be construed to restrain or restrict any legally licensed osteopathic practitioner practicing under the laws of this state.

The osteopath apparently contended that the effect of this proviso was to render the provisions of the medical practice act inapplicable to the activities carried on by a legally licensed osteopath. The Supreme Court, however, did not believe that the proviso adopted in 1907 in any way broadened the power of licensed osteopathic practitioners. In support of its holding it quoted from its prior decision in *State* v. *Dodd*, decided in 1915, and reported in 149 P. 481, reading in part, as follows:

> Counsel for appellant insists that the effect of that section, with the proviso quoted [referring to the proviso under discussion here], is to deny to every person, except osteopaths, the right to practice medicine or surgery in Montana, and that, in excepting osteopaths from the operation of its provisions, those persons thus favored are free to engage in the practice of medicine and surgery without having to submit to the ordeal of an examination and without having the certificate required of every other one who seeks to engage in like practice. . . .
>
> The proviso in section 1591 [referring to the proviso under discussion here] is a harmless piece of legislation. It did not affect the status of osteopathic practitioners in the least. They were confined thereafter, as theretofore, to the practice of osteopathy and forbidden to practice medicine or surgery without the certificate from the state board of medical examiners required of everyone who seeks to engage in such practice. . . . [The section of the osteopathic practice act defining osteopathy provides] "Every person shall be deemed practicing osteopathy within the meaning of this act who shall, . . . treat, cure, alleviate or relieve any ailment or disease of either mind or body, or cure or relieve any fracture or misplacement or abnormal condition, or bodily injury or deformity, by any treatment, or manipulation or method of manipulating a human body or any of its limbs, muscles or parts, by the use of the hands, or mechanical appliances, in an effort or attempt to relieve any pressure, obstruction, misplacement or defect, in any bone, muscle, ligament, nerve, vessel, organ or part of the body." Within the entire scope of his practice, the osteopath is confined to treatment by the use of the hands or mechanical appliances.

The court then quoted from *State* v. *Wood*, 165 P. 592, as follows:

> In *State* v. *Dodd* [citation omitted], we considered these statutes at length and concluded that the practice of medicine and surgery does not include the practice of osteopathy, and that the practice of osteopathy does not include the practice of medicine or surgery; that the Legislature has grouped all persons practicing the healing art into two distinct classes, (1) physicians and surgeons, and (2) osteopathic practitioners, and that the so-called proviso added to section 1591 above [referring to the proviso discussed in this case] "did not affect the status of osteopathic practitioners in the least. They were confined thereafter, as theretofore, to the practice of osteopathy and forbidden to practice medicine or surgery without the certificate from the state board of medical examiners required of everyone who seeks to engage in such practice." We are more than ever confirmed in the correctness of those conclusions. The so-called proviso found in section 1591 [referring to the proviso quoted in this case], and the like provision in section 1605h [referring apparently to the section of the osteopathic practice act stating the scope of the license to practice osteopathy], were doubtless enacted out of abundance of caution and to emphasize the legislative intention that neither school of practice should be held to infringe upon the other.

The attorney general, continued the Supreme Court, the attorney who appeared as amicus curiae in the argument of this case before this court and this court itself are in accord on the propositions that operative surgery includes all surgery and that the omission of the word "minor" in the 1905 amendment to the osteopathic practice act does not authorize osteopaths to perform surgery of any kind, either minor or major. We think it is clear that osteopaths have no right to perform surgical operations on human beings unless they are licensed to do so by the state board of medical examiners.

The osteopath next contended that if he was guilty of any offense at all it was that of practicing surgery without a license, whereas he was charged in the information with practicing medicine without a license. The practice of medicine and the practice of surgery, answered the court, are considered as one under our statutes and under long acceptation by people generally, and there is no authority that we have found to justify any different notion about what practicing medicine means. Surgery is described by various authorities as follows:

> "That branch of medical science, art, and practice, which is concerned with the correction of deformities and defects, the repair of injuries and diagnosis and cure of disease, the relief of suffering, and the prolongation of life, by manual and instrumental operations." *Webster's New International Dictionary.*
>
> "There cannot be a complete separation between the practice of medicine and surgery, as they are developed by modern science, and understood by the most learned in the two professions; the principles of both are the same throughout, and no one is qualified to practice either who does not properly understand the fundamental principles of both." *2 Bouv. Law Dict., Rawle's Third Revision, p. 3209.*
>
> "Therapy of a distinctively operative kind, such as cutting operations." *Century Dictionary and Cyclopedia.*
>
> "The art, practice, or work of treating diseases, injuries, or deformities by manual operation or mechanical appliances; the branch of medicine that is concerned with such treatment." *New Century Dictionary.*
>
> "The branch of healing art that resorts to manual operations or mechanical appliances for the treatment of injuries, deformities, or internal morbid conditions." *Standard Dictionary.*

The judgment of the trial court in favor of the defendant osteopath was accordingly reversed and a new trial was ordered. —*State* v. *Thierfelder, 132 P. (2d) 1035 (Mont., 1943).*

Society Proceedings

COMING MEETINGS

American Society of Anesthetists, New York, Dec. 9. Dr. McKinnie L. Phelps, 745 Fifth Ave., New York 22, Acting Secretary.

American Society of Tropical Medicine, Cincinnati, Nov. 16-18. Dr. J. S. D'Antoni, 1430 Tulane Ave., New Orleans, 13, Secretary.

American Therapeutic Society, Cincinnati, Nov. 15. Dr. Oscar B. Hunter, 1835 Eye St. N.W., Washington, D. C., Secretary.

Annual Conference of Secretaries and Editors of Constituent State Medical Associations, Chicago, Nov. 19-20. Dr. Olin West, 535 North Dearborn St., Chicago 10, Secretary.

Association for Research in Nervous and Mental Diseases, New York, Dec. 17-18. Dr. Thomas E. Bamford Jr., 115 East 82d St., New York 28, Secretary.

Eastern Section, American Federation for Clinical Research, New York, Dec. 4. Dr. Charles H. Wheeler, 345 East 68th St., New York, Acting Secretary.

Radiological Society of North America, Chicago, Nov. 29-Dec. 3. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.

Seaboard Medical Association, Richmond, Va., Nov. 30-Dec. 2. Dr. Clarence P. Jones, 3117 West Avenue, Newport News, Va., Secretary.

Society for the Study of Asthma and Allied Conditions, New York, Dec. 4. Dr. W. C. Spain, 176 East 53d St., New York, Secretary.

Southern Surgical Association, New Orleans, Dec. 7-9. Dr. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.

Southern Medical Association, Cincinnati, November 16-18. Mr. C. P. Loranz, Empire Building, Birmingham, Alabama, Secretary.

V 1 194

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1933 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

26:147-290 (Aug.) 1943

*Glucose Deficiency as Factor in Production of Symptoms Referable to Cardiovascular System. T. R. Harrison and R. M. Finks.—p. 147.
Effect on Man of Potassium Administration in Relation to Digitalis Glycosides, with Special Reference to Blood Serum Potassium, Electrocardiogram and Ectopic Beats. J. J. Sampson, E. C. Alberton and B. Kondo.—p. 164.
*Embolism and Secondary Thrombosis of Bifurcation of Aorta: A. Coronary Occlusion with Endomyocardial Infarction; B. Mitral Stenosis with Atrial Fibrillation. G. R. Herrmann, J. G. Willis, W. F. McKinley and L. Karotkin.—p. 180.
Electrocardiographic Changes During Pneumoencephalography. M. W. Bick and B. S. Epstein.—p. 200.
*Variation in Circulatory and Respiratory Responses to Carotid Sinus Stimulation in Man. M. Galdston, R. Goldstein and J. M. Steele.—p. 213.
Effect of High Protein Diet and Urea Administration on Blood Pressure of Normal Dogs and of Dogs with Experimental Renal Hypertension. J. L. Guerrant, J. K. Scott and J. E. Wood Jr.—p. 232.
Cardiac Complications in Acute Glomerulonephritis. H. M. Odel and W. S. Tinney.—p. 239.
Pressor Action of Paredrine: Further Observations. A. Iglauer and W. E. Molle.—p. 247.
Electrocardiographic Manifestations of Early Acute Cor Pulmonale. C. H. Scheifley and T. J. Dry.—p. 264.
Coronary Thrombosis and Myocardial Infarction in Youth: Report of Case, with Autopsy, in 19 Year Old Male. L. Zacks.—p. 269.

Dextrose Deficiency and Cardiovascular Symptoms.—Harrison and Finks emphasize the relationship of certain disturbances of cardiovascular function to a metabolic disorder characterized by the following features: (1) The symptoms practically always occur two or more hours after meals, (2) they can usually be reproduced by the injection of insulin, (3) they can be relieved by the ingestion of dextrose and—in large measure—prevented by dietary regulation, and (4) at the time the symptoms occur the level of the blood sugar is usually either slightly subnormal or within the lower limits of the normal range. The disturbance of carbohydrate metabolism which is responsible for these symptoms has been designated as "relative hypoglycemia." It is a common factor in the production of symptoms referable to the circulatory system and has been found in 31 of the latest 204 patients with cardiovascular complaints seen by the authors. Relative hypoglycemia may produce manifestations identical with those observed in patients with cardiac neurosis. The two conditions are difficult to differentiate and they frequently coexist. Relative hypoglycemia may be a "trigger" factor in precipitating various arrhythmias (including paroxysmal tachycardia) as well as attacks of angina pectoris, hypertensive encephalopathy, carotid sinus syncope and circulatory disturbances associated with the menopause. Relative hypoglycemia is frequently associated with pain in the chest which is nonanginal in character. Occasionally in patients with typical effort angina it induces attacks of angina pectoris at rest. The circulatory manifestations of relative hypoglycemia are the same as those observed after the experimental or therapeutic administration of insulin. They appear to be related to two mechanisms: release of epinephrine and alterations comparable to those which occur in anoxia. The increased venous return, so brought about, causes an augmented cardiac output and the typical signs of the "overactive heart." The attempt to reproduce the symptoms in a given case by insulin administration is a more valuable diagnostic method for certain patients than the dextrose tolerance test. Both methods are less important than the history. When relative hypoglycemia is causing symptoms, benefit can usually be obtained by the use of a diet which is poor in carbohydrates and rich in protein, with intermediate feedings. Observation of the response to such a diet is therefore at times a helpful diagnostic measure.

Embolism and Secondary Thrombosis of Bifurcation of Aorta.—Herrmann and his collaborators report 5 cases of saddle embolus at the bifurcation of the aorta, with one recovery, and necropsy studies in 3 cases. The first 2 patients were elderly men with hypertensive arteriolar disease, atheromatosis, coronary thrombosis, endomyocardial infarction and mural thrombi. These thrombi gave rise to emboli which lodged at the bifurcation of the atheromatous aortas, followed by secondary thrombosis. The third patient was an elderly woman with rheumatic mitral stenosis and insufficiency, atrial fibrillation, vegetative endocarditis, hypertensive arteriolar disease and mural thrombi in all of the heart chambers. An embolus, probably from the left atrium, saddled the bifurcation of the aorta. Arteriosclerosis of the aorta near the bifurcation apparently was responsible for massive, secondary thrombosis. The last 2 patients were younger persons with rheumatic mitral stenosis and insufficiency and atrial fibrillation. They apparently had less aortic disease and survived longer after the emboli lodged at the aortic bifurcation. Both subsequently had cerebral embolism; 1 died and 1 survived. Conservative medical treatment was practiced in all instances. Heparinization and surgical intervention would probably have been successful in some of the cases. The authors stress that patients with coronary occlusion and myocardial infarction and those with rheumatic mitral disease and auricular fibrillation or verrucous endocarditis are candidates for saddle embolism. The bifurcation of the aorta, iliacs or other great arteries are not uncommon sites for the lodgment of relatively large emboli. The secondary aortic thromboses that follow in atheromatous aortas are most serious. The occurrence of abdominal cramps should lead one to suspect movement of the emboli down the aorta. Sudden sharp pains in one leg and then in the other, followed by paresthesias, coldness, blanching, lowered skin temperatures and absent or greatly decreased femoral pulses, should lead one to suspect lodgment of an embolus at the bifurcation of the aorta. Oscillometric studies are confirmatory of the absence of pulsations. When the embolus is small and the obstruction incomplete, a much less clearcut clinical picture is presented. Papaverine hydrochloride in a dose of 0.032 Gm. (½ grain) intravenously should be started as soon after the onset as possible. Morphine is used to control the pain. Whisky should be administered freely. Passive movements, postural exercises and passive vascular exercise are to be undertaken. Lumbar sympathetic block should be produced to relieve pain and cause maximum peripheral vasodilatation. In elderly persons because of the great likelihood of secondary thrombosis, heparinization should be instituted. Heparinization followed by dicumarol may some day become a routine emergency procedure in the treatment of all cases of massive coronary thrombosis. The patients with rheumatic heart disease seem to have the best prognosis as far as saddle embolism is concerned.

Responses to Carotid Sinus Stimulation in Man.—Galdston and his associates review the history of research on carotid sinus stimulation, giving particular attention to the investigations of Weiss and his co-workers, who distinguished three types of syncope resulting from carotid sinus stimulation. The first, in which syncope is accompanied by definite slowing of the heart rate or asystole and a consequent fall in arterial pressure, is designated the "vagal type"; the second, in which a pronounced fall in arterial pressure occurs without significant slowing of the heart, the "depressor type"; and the third, in which there is syncope without either slowing of the heart or fall in arterial pressure, the "cerebral type." The authors studied the relationships, in point of time, between changes in arterial pressure, pulse rate, venous pressure, respiration and the onset of syncope and convulsions. One hundred persons were examined, 26 of whom presented a sensitive carotid sinus reflex. Of these, 17 regularly had convulsive seizures on stimulation of the carotid sinus. The common circulatory response in the 17 persons was slowing of the heart and asystole (vagal response) with a fall in arterial pressure (depressor response). A pure vagal response was next most common. A pure depressor response was not observed except when the patient was

under the influence of atropine. Paredrine hydrobromide prevented to a large degree the depressor responses. Two patients had convulsions without significant circulatory change (cerebral type). In 3 other patients syncope and convulsions persisted when circulatory changes were inhibited by the administration of atropine or paredrine. Hyperpnea is the regular respiratory response to digital pressure in the region of the carotid sinus. Its occurrence is independent of the circulatory response. It is independent of age or sex. It is not prevented by barbiturate anesthesia, but local infiltration of the region about the carotid sinus and carotid body with procaine hydrochloride abolishes it. Prolonged stimulation is often followed by a phasic type of respiration similar to Cheyne-Stokes breathing. Evidence is presented that hyperpnea after pressure on the neck in the region of the carotid sinus in man may be caused by a disturbance of the blood supply to the carotid body rather than by mechanical stimulation of the carotid sinus.

American Journal of Public Health, New York

33:1043-1186 (Sept.) 1943

Child as Wartime Problem. R. H. Parry.—p. 1043.
Laboratory Examination of Eating and Drinking Utensils. R. L. France, J. E. Fuller and W. E. Cassidy.—p. 1054.
Venereal Disease Epidemiology, Third Service Command: Analysis of 4,641 Contact Reports. E. W. Norris, A. F. Doyle and A. P. Iskrant.—p. 1065.
Course of Serologic Tests During Therapeutic Malaria in Patients with Syphilis. B. I. Kaplan and I. J. Brightman.—p. 1073.
*Effect of Activated Sludge Process of Sewage Treatment on Poliomyelitis Virus. H. J. Carlson, G. M. Ridenour and C. F. McKhann Jr. p. 1083.
Tuberculosis Survey Among Employees of Santiago, Chile. B. Viel and E. A. Jelic.—p. 1088.
Public Health and Economic Aspects of Pneumonia—Comparison with Presulfonamide Years. H. E. Ungerleider, H. W. Steinhaus and R. S. Gubner.—p. 1093.
Industrial Eye Health Problems. H. S. Kuhn.—p. 1103.
Tetanus Toxoid and Its Use for Active Immunization. D. T. Fraser, D. L. MacLean, M. D. Orr, H. C. Plummer and F. O. Wishart. —p. 1107.
Use of Current Birth Certificates in Planning a Maternal and Child Health Program. W. C. Welling, Martha L. Clifford and E. T. Tracy.—p. 1115.

Effect of Activated Sludge Process on Poliomyelitis Virus.—Carlson and his associates investigated the effect of the activated sludge process as used in municipal sewage disposal plants on the removal or inactivation of a mouse adapted strain of poliomyelitis virus. Virus suspension 1 : 300 was used in sludge concentrations of 1,100, 2,200 and 3,300 parts per million with aeration periods of zero, six and nine hours. The results indicate that activated sludge in amounts as low as 1,100 parts per million with six hours' aeration will remove or inactivate the virus to a sufficient extent to reduce greatly infectivity for mice injected intracerebrally. Heavier concentrations of sludge with longer aeration periods largely eliminate infectivity.

Archives of Dermatology and Syphilology, Chicago

48:251-358 (Sept.) 1943

Halowax Acne ("Cable Rash"): Cutaneous Eruption in Marine Electricians Due to Certain Chlorinated Naphthalenes and Diphenyls. C. K. Good and N. Pensky.—p. 251.
Cutaneous Tests with Hen's Egg White Fractions in Atopic Infantile Eczema. S. E. Ditkowsky, R. Hecht, A. G. Cole and Belle Levin. —p. 258.
Colloid Pseudomilium: Review of Its Nomenclature and Report of Case. H. L. Arnold Jr.—p. 262.
*Keratoderma Climactericum (Haxthausen): Hypoestrogenic Keratodermatitis. F. W. Lynch.—p. 270.
Mosaic Fungus: Cholesterol Intercellular Artefact. T. Cornbleet, H. C. Schorr and H. Popper.—p. 282.
Pityriasis Rubra Pilaris of Familial Type: Experiences in Therapy with Carotene and Vitamin A. A. L. Weiner and A. A. Levin. —p. 288.
Blood Level and Excretion of Arsenic Following Single Injections of Chorarsen. H. B. Henning and R. H. Kampmeier.—p. 297.
Treatment of Acne Vulgaris with Comedos by Monoterminal Electrodesiccation. R. Nomland.—p. 302.
Incidence of Psoriasis Among Population at Large. E. Gahan.—p. 305.
Changes in Finger Nails in Pulmonary Tuberculosis. A. L. Banyai and A. V. Cadden.—p. 306.
Yellow Dermographia. V. J. Derbes and H. T. Engelhardt.—p. 310.

Hypoestrogenic Keratodermatitis.—Lynch describes 10 cases of hypoestrogenic keratodermatitis. Microscopic changes as seen in a study of 5 specimens presented a greater degree of inflammatory reaction than was noted in the case studied by Haxthausen. Swelling of the collagenous fibers and degeneration of the elastin were also noted. In most cases a favorable effect resulted from administration of diethylstilbestrol for as short a period as one or two weeks. To obtain a cure the treatment had to be continued for several months. It is not possible to point out clinical or microscopic features which allow differentiation of hypoestrogenic keratodermatitis from neurodermatitis. It is the author's belief that the palmar and plantar eruption described by Brooke and known as keratoderma climactericum (Haxthausen) is a form of variant of neurodermatitis. The eruption is associated with a disturbed estrogenic activity in so large a proportion of cases that one is forced to regard the association as of major etiologic significance. The favorable clinical response to administration of estrogens is more striking than the occasional moderately favorable influence of these agents on the more common forms of neurodermatitis. These reasons lead Lynch to believe that the disease will be recognized more generally and treated more intelligently if such cases are described under another title rather than under the broad and frequently misunderstood term "neurodermatitis." Because the disease occurs also in women who have evidence of endocrine disorder but are not approaching or passing through the climacteric and because the term keratoderma is not acceptable to authorities on nomenclature, Lynch suggests that "hypoestrogenic keratodermatitis of the palms and soles" is a more suitable title than the terms applied by Brooke or by Haxthausen.

Canadian Medical Association Journal, Montreal

49:161-250 (Sept.) 1943

*Effect of Surgical Operations on Blood Pressure. J. D. Adamson and Sara Dubo.—p. 161.
Some Aspects of Sterility. J. S. Henry.—p. 167.
Fractures of Metacarpals Treated by New Method. H. R. C. Norman. —p. 173.
Case of Carcinoma of Nasopharynx. V. de Boissiere.—p. 176.
*Radiation Treatment of Cancer of Cervix. N. A. McCormick.—p. 178.
Problem of Varicose Disease. G. A. Holland.—p. 184.
Diabetes Mellitus Associated with Addison's Disease. N. W. Nix. —p. 189.
Some Observations on Panama Passage. W. A. Paddon.—p. 191.
Epidermolysis Bullosa with Digestive Disturbances. M. J. M. LaSalle. —p. 194.
Indications for Drug Therapy in Heart Disease. S. U. Page.—p. 195.
Simplified Classification of Skin Diseases. K. A. Baird.—p. 200.

Effect of Surgical Operations on Blood Pressure.—Adamson and Dubo direct attention to the spontaneous, nontherapeutic, oscillation in blood pressure, because it has been frequently overlooked in judging therapeutic effects. The most recent innovation in the treatment of essential hypertension is sympathectomy. According to some reports, gratifying results have been obtained. All postoperative improvement, whether objective or subjective, is usually attributed to the specific effect of the operation. In view of the known lability of blood pressure and the effect of suggestion on symptoms, these claims demand critical examination. Volini and Flaxman have produced evidence to show that symptomatic relief and reduction in blood pressure resulting from nonspecific surgical measures, e. g. hysterectomy, prostatectomy and cholecystectomy, in the presence of essential hypertension are similar to and sometimes better than those obtained by extensive sympathectomy, splanchnic nerve section or celiac ganglionectomy. The authors determined blood pressure changes associated with major nonspecific operations and compared them with those claimed for various sympathectomy operations. The blood pressures of 208 patients before and after major operations and 28 additional patients with hypertension who were not operated on were followed during hospitalization. There was a definite reduction in blood pressure in all cases which was similar in the two groups. Alleged specific effects must be measured against known nonspecific effects which take place concurrently with all surgical operations. Careful and prolonged observation under various conditions must be made before and after sympathectomy before definite conclusions can be arrived at.

Radiation Treatment of Cancer of Cervix.—McCormick reviews the different methods in the treatment of cervical cancer and shows that the combination of x-rays and radium is the best. He describes the technic of this treatment and reviews observations in 135 cases. He arrives at the following con-

clusions: 1. Carcinoma of the cervix should be treated by radiotherapeutic methods without previous surgical intervention and with as little manipulative trauma as possible. 2. Roentgen irradiation must be adequate and given without thought of expense. 3. This can be achieved with modern 200 kilovolt equipment, but only by the use of long skin target distances and heavy filtration. 4. The roentgen irradiation is followed by radium treatment. 5. The expense of the patient is comparable to that of any major surgical procedure. 6. The results in all but the most hopelessly advanced cases are encouraging and superior to earlier methods of treatment. 7. Patients living and apparently free from cancer at the end of three years may reasonably be expected to remain well for at least a five year period. 8. Fifty per cent of patients treated as described are living normal lives five years later.

Indiana State Medical Assn. Journal, Indianapolis

36:425-534 (Sept.) 1943

Ninth Naval District Medical Services. H. L. Dollard.—p. 425.
History of Organized Anesthesia in Indiana. F. T. Rumberger.—p. 428.
Surgical Management of Perforative Appendicitis. W. C. Reed, B. Word and C. E. Brock.—p. 437.
Determination of Prognosis in Glomerulonephritis by Clinical Methods. P. C. Dietz.—p. 441.
Head Injuries Followed by Postconcussional Syndrome. L. W. Painter. —p. 443.
Absorption of Sulfanilamide from Burned Surfaces. M. B. Welborn. —p. 447.

Journal of Allergy, St. Louis

14:437-506 (Sept.) 1943

Contact Reactions in Atopy: III. Contact Reactions in Various Atopic Illnesses. M. Albert and M. Walzer.—p. 437.
Electrophoretic Studies on Chemical Fractionation of Ragweed Pollen Extracts. J. M. Newell.—p. 444.
Volumetric Incidence of Atmospheric Allergens: I. Specific Gravity of Pollen Grains. O. C. Durham.—p. 455.
Effect on Sodium, Potassium and Thiosulfate Ions on Anaphylaxis. R. G. Carlson and R. W. Whitehead.—p. 462.
Weltmann Reaction in Bronchial Asthma. Susan C. Dees, with technical assistance of Susan Spell.—p. 469.
Dermatitis Due to Resin Finished Shorts and Fabrics: Investigation of Cause, Pathogenesis and Related Phenomena Observed in 10 Cases. H. Keil.—p. 477.
Use of Aminophylline Rectal Suppositories in Treatment of Bronchial Asthma: Preliminary Report. Susan C. Dees.—p. 492.
Plasma Treatment of Severe, Near Fatal Anaphylactic Shock. A. H. Raynolds.—p. 495.

Journal of Aviation Medicine, St. Paul

14:157-232 (Aug.) 1943

Study of Effects of Airplane Transportation of 200 Patients. J. H. Tillisch, J. F. Stotler and W. R. Lovelace II.—p. 162.
Steroid Excretion and Stress of Flying. G. Pincus and H. Hoagland. —p. 173.
Organ Weight-Body Weight Ratios in Dogs Following Exposures to Discontinuous Anoxia. E. J. Van Liere and J. C. Stickney.—p. 194.
Interesting Application of Basic Science to Aviation Medicine. F. E. Randall and A. Damon.—p. 200.
Observations on Results of Indoctrination of Aviation Personnel in Use of Oxygen Equipment in Low Pressure Chamber at Pensacola, Florida. H. A. Smedal.—p. 206.
*Treatment of Aero-Otitis Media by Redecompression. H. A. Smedal, H. R. Bierman and J. L. Lilienthal Jr.—p. 211.
Present Trends in Teaching at Army School of Aviation Medicine. C. E. Kossmann.—p. 216.

Treatment of Aero-Otitis Media by Redecompression.—Smedal and his associates report that of more than 10,000 individuals who have been subjected to rapid changes in barometric pressure in the low pressure chamber at the U. S. Naval Air Training Center, Pensacola, Fla., approximately 12 per cent have developed "ear block" during "descent" or recompression in the chamber, and many of the same group presented symptoms and signs of aero-otitis media. The precipitating event which precedes the development of aero-otitis media is an increase in the ambient pressure without compensatory ventilation of the middle ear by way of the eustachian tube. The resultant relative vacuum is responsible for the vascular hyperemia and fluid exudation within the middle ear, and thus for the symptoms. The treatment by redecompression consisted of a rapid "reascent" in the low pressure chamber to a pressure altitude which permitted voluntary ventilation of the affected middle ear. In the individuals studied, this altitude averaged 5,000 feet but varied from 3,000 to 8,000 feet. It proved necessary to urge each patient to maintain voluntary ventilation of the middle ear by frequent swallowing, or a modified Valsalva maneuver, because the course of aero-otitis media was marked by periodic recurrences of reduced pressure within the middle ear and the characteristic accompaniments of pain, sense of fulness and diminished hearing acuity. In 27 of a group of 33 men with severe aero-otitis media, this form of treatment has effected immediate relief of symptoms and rapid resolution of the process. The failures occurred in patients who for any reason were unable to effect or to maintain aeration of the middle ear during and after redecompression. The simplicity of treatment by redecompression recommends its use in preference to catheterization of the eustachian tube.

Journal of Immunology, Baltimore

47:89-180 (Aug.) 1943

Chemistry of Pollen Extracts: II. Phosphotungstic Acid as Protein Precipitant in Standardization of Ragweed Pollen Extract. E. A. Brown and N. Benotti.—p. 89.
Mouse Protective Test as Uniform Method of Assay for Antibacterial and Antiviral Serums. P. A. Little.—p. 97.
Specificity of Antibodies to Antigens Containing Two Different Determinant Groups. F. Haurowitz and P. Schwerin.—p. 111.
Studies on Specific Mechanism of Serum Sickness: III. Passive Sensitization with Antibody Contained in Serum Sickness Convalescent Serum. S. Karelitz and A. Glerig.—p. 121.
Relationship of Protein Reserves to Antibody Production: I. Effects of Low Protein Diet and of Plasmapheresis on Formation of Agglutinins. P. R. Cannon, W. E. Chase and R. W. Wissler.—p. 133.
Inheritance of Agglutinogen of Chicken Erythrocyte. C. Olson Jr. —p. 149.
Agglutinogen of Hemophilus Pertussis, Phase I, for Skin Testing: Theoretical Considerations and Simple Method of Preparation. J. Smolens and S. Mudd.—p. 155.
Immunologic Studies of Pollinosis: IV. Relationship Between Thermostable Antibody in Circulation and Clinical Immunity. Mary Hewitt Loveless.—p. 165.

Journal of the Mount Sinai Hospital, New York

10:341-388 (July-Aug.) 1943

Pharmacology and Toxicology of Sulfonamides. E. P. Pick.—p. 343.
Retroperitoneal Teratoid Tumors in Infancy and Childhood. E. E. Arnheim.—p. 355.
Significance of Somatic Stigmatization in Childhood. R. Wagner. —p. 365.

Journal of Nervous and Mental Disease, New York

98:229-342 (Sept.) 1943

Alterations in Communicability, Content of Thought and Affective Response During Irritative (Camphor) Therapy. E. Friedman.—p. 229.
Agranulocytosis Following Malarial Therapy in General Paresis. T. J. Heidt and G. A. Goder.—p. 248.
Principle of Evolution of Nervous Function. W. Riese.—p. 255.
Mental Symptoms in Multiple Sclerosis: Study of 28 Cases with Review of Literature. M. Sugar and R. Nadell.—p. 267.
Neuropsychiatric View of German Culture: Treatment of Germany. R. M. Brickner and L. V. Lyons.—p. 281.
Psychiatry and Neurology One Hundred Years and Fifty Years Ago. H. Stanka.—p. 294.

Journal Pharmacology & Exper. Therap., Baltimore

73:321-414 (Aug.) 1943

Blood Pressure and Respiratory Changes Produced by Strychnine Convulsions. B. E. Abreu and R. A. Woodbury.—p. 321.
Effect of Cocaine on Inactivation of Epinephrine and Sympathin. Clara Torda.—p. 331.
Influence of Low Concentrations of Cocaine on Metabolism of Phenol. Clara Torda.—p. 336.
Comparative Toxicity of Chloral Alcoholate and Chloral Hydrate. W. L. Adams.—p. 340.
Absorption of Quinine Sulfate and Quinine Dihydrochloride from Isolated Intestinal Loops of Dogs. J. C. Andrews and C. E. Anderson. —p. 346.
Absorption Rates of Insulin, Globin Insulin and Protamine Zinc Insulin Labeled with Radioactive Iodine. L. Reiner, E. H. Lang, J. W. Irvine Jr., W. Peacock and R. D. Evans.—p. 352.
Effects of Anesthetic Agents on Muscular Contraction. E. G. Gross and S. C. Cullen.—p. 358.
Fate of Sulfonamides and p-Aminobenzoic Acid in Cold Blooded Animals. R. B. Failey Jr., R. C. Anderson, F. G. Henderson and K. K. Chen. —p. 366.
Action of Riddelline. P. N. Harris, R. C. Anderson and K. K. Chen. —p. 372.
Inactivation of Cholinesterase by Morphine, Dilaudid, Codeine and Desomorphine. C. I. Wright and J. C. Sabine.—p. 375.
Reduction of 2,4,6-Trinitrotoluene by Animal Tissue in Vitro. B. B. Westfall.—p. 386.
Conjugation in Vitro of Phenol by Guinea Pig Liver. F. Bernheim and Mary L. C. Bernheim.—p. 394.
Effect of Anesthesia on Lymph Flow (Local Procaine, Ether, Pentobarbital Sodium). H. Polderman, Jane D. McCarrell and H. K. Beecher.—p. 400.

Journal of Urology, Baltimore

50:123-264 (Aug.) 1943

Renal Ectopia: Report of 2 Cases. C. F. Rusche and J. L. Bray.—p. 123.
Secondary Pathologic Changes in Polycystic Kidney Disease. R. M. Bobbitt.—p. 131.
Surgical Management of Acute Renal Infections. J. Duff, H. R. Kenyon and J. W. Hauser.—p. 141.
Unilateral Renal Agenesis: Anatomic Description of Specimen. E. H. Daseler and B. J. Anson.—p. 155.
Ascites: Operation for Its Relief: Case Report. C. Ferguson.—p. 164.
Urinary Lithiasis: Review of Quarter Century of Research. L. D. Keyser.—p. 169.
Bactericidal Action of Stone Dissolving Agent "Solution G." H. R. Sauer and E. Neter.—p. 191.
Solution of Vesical Phosphatase Calculi. D. J. Abramson.—p. 197.
Metabolism of Citric Acid in Urolithiasis. W. W. Scott, C. Huggins and Bernice C. Selman.—p. 202.
*Total Cystectomy for Carcinoma of Bladder. J. T. Priestley and G. W. Strom.—p. 210.
Cancer of Prostate: Clinicopathologic Study of 34 Cases in Negroes. W. S. Quinland.—p. 228.
Blastomycosis of Epididymus: Report of 4 Cases. C. E. Jacobson Jr. and M. B. Deckerty.—p. 237.
Mesothelioma of Epididymis and Tunica Vaginalis. N. Evans.—p. 249.
Tumors of Spermatic Cord: Report of Hemangioma. H. A. Zide.—p. 255.
Sodium Mandelate, an Intravenous Solution Available for Therapeutic Use. G. Carroll and R. Coleman.—p. 258.
Cystoscopic Radon Applicators. F. H. Eaton.—p. 263.

Total Cystectomy for Carcinoma of Bladder.—Priestley and Strom reviewed the records of all cases in which total cystectomy for neoplasm was performed at the Mayo Clinic from 1910 to Aug. 31, 1942 inclusive. In each of these cases a malignant lesion was demonstrated by pathologic examination of a specimen taken for biopsy prior to operation. The total number of patients operated on was 105. There were 51 patients who survived total cystectomy for carcinoma of the bladder. Of these 51 patients 26 have died since operation, 15 of these within the first postoperative year. The remainder died at intervals ranging from one to six and one-fourth years after operation. The cause of death was ascertained for 20 of this group of 26 patients. Metastasis was the cause of death of 16, whereas 4 died of renal failure. Of 13 who died because of metastasis, extension of the carcinoma beyond the bladder was noted at the time of operation. It appears unwise to perform cystectomy if the growth has extended so that its complete removal is questionable. There is a small group of patients who may die some time after operation because of pyelonephritis and its complications, but it is hoped that, as experience with ureterosigmoidostomy grows, the incidence of such renal complications will be reduced. Of the group of 51 patients who survived cystectomy, 24 are still alive and 1 could not be traced. The length of postoperative experience for this group of patients is too brief to permit an accurate estimate of ultimate survival rates. Seventeen have been operated on within the past year. Eight patients are living one to twenty-eight years after operation. Despite the comparatively high operative mortality rate associated with this procedure in years past, total cystectomy has appeared to be the only hope of cure in many cases of carcinoma of the bladder. Indications for the operation remain controversial and will be determined definitely only by more experience. Careful selection of patients and close attention to preoperative and postoperative care as well as to the fundamentals of operative technic have reduced the initial operative mortality rate to a point where total cystectomy can be considered a justifiable procedure.

Maine Medical Association Journal, Portland

34:147-168 (Aug.) 1943

Emergency Medical Service. A. W. Reggio.—p. 147.
Dementia Precox. F. C. Tyson.—p. 151.

Nebraska State Medical Journal, Lincoln

28:273-304 (Sept.) 1943

Interpreting Paradoxic Reactions in Serology of Syphilis. R. L. Kahn.—p. 276.
Psychoneuroses of War. G. A. Young.—p. 280.
Should Most Gastric Ulcers Be Treated Surgically or Medically? J. D. Bisgard.—p. 285.
Traumatic Injuries of Urinary Tract: Part I. Straddle Injuries of the Urethra. P. Adams.—p. 288.

New England Journal of Medicine, Boston

229:309-352 (Aug. 19) 1943

*Pulmonary Embolism Due to Quiet Venous Thromboses and Simulating Cardiac and Pulmonary Disease. J. Homans.—p. 309.
Health Examination of Adolescents. J. R. Gallagher.—p. 315.
Nutritional Background of Patients with Rheumatoid Arthritis. T. B. Bayles, H. Richardson and F. C. Hall.—p. 319.
Advances in Malaria Research (concluded). Q. M. Geiman.—p. 324.

Pulmonary Embolism Due to Quiet Venous Thrombosis.—Homans reports 11 cases of quiet thrombosis in the lower limb causing pulmonary embolism in ambulatory patients. Six similar cases are reported in which an old thrombophlebitis, an injury or an illness had preceded the thrombosis. Quiet thrombosis, or so-called phlebothrombosis, is a noninflammatory, reactionless process. It takes place in the deep veins of the legs, usually below the knees. The peculiar and dangerous quality of a quiet venous thrombosis lies in its decided tendency to form a loose, soft, detachable thrombus. The explanation of the lack of statistics warning the profession of the incidence of quiet thrombosis and consequent embolism lies in this, that the more silent the process the greater is the danger of embolism. A fatal pulmonary accident may come from a leg that even those most familiar with venous thrombosis must consider normal, and by contrast the great swollen leg of thrombophlebitis almost never causes embolism. The original thrombosis may pursue three courses: recovery without extension, development into phlegmasia alba dolens, and formation of a propagating thrombus with pulmonary embolism. Consideration of the cases presented shows that, since pulmonary infarction and embolism often simulate cardiac and pulmonary disease in ambulatory patients otherwise well, they must be considered in the differential diagnosis of many acute and recurrent thoracic disorders. Repeated embolism associated with quiet thrombosis is not rare; the dangerous or fatal quality of any one process is unpredictable; operative treatment to secure interruption of the thrombosed vein proximal to the source of embolism is always indicated. Conservative treatment, even if not followed by further embolism, is unlikely to prevent continuance or recurrence of the thrombosis. The use of heparin does not protect against repeated embolism and a fatal outcome.

229:353-386 (Aug. 26) 1943

*Effect of Vitamin K_1 Oxide on Hypoprothrombinemia Induced by Dicumarol. C. S. Davidson and Harriet MacDonald.—p. 353.
Cardiac Arrhythmias Following Pneumonectomy. C. C. Bailey and R. H. Betts.—p. 356.
Cardiac Arrhythmias Following Thoracic Surgery. J. H. Currens, P. D. White and E. D. Churchill.—p. 360.
Bright's Diseases. S. E. Bradley.—p. 364.

Vitamin K_1 Oxide in Hypoprothrombinemia Induced by Dicumarol.—Davidson and MacDonald show that dicumarol as an anticoagulant has advantages over heparin, such as activity when given by mouth and relatively low cost, but it has the serious disadvantage of lack of control. Several investigators have demonstrated that vitamin K has an action antagonistic to dicumarol. The authors were able to reverse the hypoprothrombinemia produced by dicumarol in 3 out of 4 patients by administration of large doses of vitamin K_1 oxide. It is probable that an inadequate amount of the vitamin was administered to the fourth patient. In 1 patient the administration of vitamin K_1 oxide prevented the subsequent establishment of a hypoprothrombinemia following the administration of dicumarol. The amount of vitamin K_1 oxide required to produce the desired effect varied considerably from patient to patient. No serious toxic manifestations were observed from the administration of large amounts of the vitamin. The only untoward action observed was transient headache and, in 1 patient, vomiting. It is suggested that the action of vitamin K_1 oxide in reversing the hypoprothrombinemia established by single doses of dicumarol may make the therapeutic use of this anticoagulant safer than it has been heretofore.

New Jersey Medical Society Journal, Trenton

40:297-348 (Aug.) 1943

Fundus Lesions in Syphilis. A. Rados.—p. 304.
Report of Death After Tonsillectomy with Recommendations, Also An Outline of Simple and Rapid Method of Operation. M. Esther Cushnie and C. H. Knauer.—p. 311.

Oklahoma State Medical Assn. Jour., Oklahoma City

36:323-368 (Aug.) 1943

Epidemic Poliomyelitis. L. W. Hunt.—p. 323.
Plan for Use of Blood Plasma in Rural Communities. A. R. Wiley. —p. 329.
Lower Abdominal Pain in Female. C. M. Longstreth.—p. 330.
Recent Advances in Psychosomatic Medicine. C. E. Leonard.—p. 334.
Epidemic Keratoconjunctivitis: Summary of Recent Literature. V. C. Myers.—p. 337.

Pennsylvania Medical Journal, Harrisburg

46:1121-1248 (Aug.) 1943

Influence of Sensitivity and Immunity on Ocular Tuberculosis. A. C. Woods.—p. 1133.
*Early Diagnosis of Cancer of Colon. W. L. Estes Jr.—p. 1139.
Elimination of Colostomy in *Radical Treatment of Cancer of Large Bowel: Based on Over 400 Cases. W. W. Babcock and H. E. Bacon.—p. 1143.
Deformities of Duodenum Other Than Those Due to Ulcer. J. T. Farrell Jr.—p. 1149.
Hodgkin's Disease in Dermatologic and General Practice. G. J. Busman and J. M. Johnston.—p. 1153.
What Can Be Done for Child with Beginning Deafness? D. MacFarlan. —p. 1157.
Differential Diagnosis of Edema of Optic Disk. G. B. Gibson.—p. 1164.
Clinical Evaluation of Bactericidal Lamp (Gosztonyi). A. Fisher. —p. 1166.
Hyperchromic Anemia in Chronic Biliary Dysfunction Response to Liver Therapy. M. G. Colvin.—p. 1168.
Infectious Mononucleosis. K. M. Houser.—p. 1173.

Early Diagnosis of Cancer of Colon.—Estes reviewed 40 proved cases of cancer of the large intestine to ascertain some criterion whereby cancer of the colon might be suspected from its first manifestations. He found that in 85 per cent the first complaint was abdominal pain or intermittent colic associated with constipation and relieved by the passage of gas or defecation not accompanied by obvious change in stools. After it was recognized that these symptoms are suggestive of cancer of the large intestine, a particularly exhaustive investigation of patients presenting these symptoms was undertaken. As a result, in the next one and a half years the resectability rate for cancer of the colon increased from 45 to 85 per cent. The author concludes that all persons, especially those over 40 years of age, with a change in bowel habit and with unexplained local abdominal pain, intermittent gas cramps or distention should be suspected of having a cancer of the colon until proved otherwise. Persons presenting these symptoms should have an exhaustive clinical survey including bimanual rectal and pelvic examination, sigmoidoscopy, x-ray study, test for occult blood in the stool and peritoneoscopy when indicated. If these cases are suspected and proper investigation made, cancer of the large intestine can be discovered in a sufficiently early stage to permit radical surgical resection and cure.

Public Health Reports, Washington, D. C.

58:1233-1264 (Aug. 13) 1943

*Jaundice Following Administration of Human Serum. J. W. Oliphant, A. G. Gilliam and C. L. Larson.—p. 1233.
Toxic Effects of Atabrine and Sulfadiazine in Growing Rats. C. I. Wright and R. D. Lillie.—p. 1242.
Sickness Absenteeism Among Male and Female Industrial Workers, 1933-1942, Inclusive. W. M. Gafafer.—p. 1250.

58:1265-1292 (Aug. 20) 1943

Incidence and Prevalence of Cancer of Lung. H. F. Dorn.—p. 1265.
Carbarsone Treatment for Balantidium Coli Infections. M. D. Young and R. Burrows.—p. 1272.
Sickness Absenteeism Among Industrial Workers, First Quarter of 1943, with an Inquiry into Occurrence of Respiratory Diseases, 1934-1943. W. M. Gafafer.—p. 1273.
Mechanism of Antitoxic Immunity in Clostridium Perfringens (Welchii) Infections in Guinea Pigs. Sarah E. Stewart.—p. 1277.

58:1293-1328 (Aug. 27) 1943

Studies on Trichinosis: XV. Summary of Findings of Trichinella Spiralis in Random Sampling and Other Samplings of Population of the United States. W. H. Wright, K. B. Kerr and L. Jacobs. —p. 1293.

Jaundice Following Administration of Human Serum.—Oliphant and his associates studied hepatitis following the use of yellow fever vaccine when an outbreak occurred in the Virgin Islands in the summer of 1942. A total of 11,358 individuals on the islands of St. Thomas and St. John was inoculated with lot 331 yellow fever vaccine containing pooled human serum. The vaccinations were performed between March 4 and March 28, 1942. Jaundice was first noted in May. It was estimated that between 300 and 500 cases occurred. A survey revealed that among the vaccinated population the incidence of jaundice was 14.7 per cent. The disease varied from very mild to extremely severe cases. It seems evident from the prolonged incubation period and from the clinical symptoms that the disease under observation was identical with that previously described and designated as homologous serum jaundice. In experimental studies the authors produced jaundice by inoculation of two lots of yellow fever vaccine containing pooled human serum. Jaundice was produced by the inoculation of small amounts of filtered serum from 2 individuals and a group of 9 individuals who had previously received yellow fever vaccine containing human serum. The jaundice producing agent is filtrable and survives drying in vacuum storage for long periods in serum at 4 C. and heating to 56 C. for one-half hour in the dried state. Evidence is presented that the jaundice producing agent is present in the blood before jaundice appears but not two and one-half months after disappearance of jaundice. There was evidence suggesting that the jaundice producing agent may be neutralized by ultraviolet irradiation. The sexes are apparently equally susceptible. Transmission of this type of jaundice by ordinary contact has not occurred during this study. Attempts to produce jaundice in experimental animals and to develop a complement fixation test were unsuccessful. It was recognized in 1942 during an epidemic of jaundice in the United States Army that some agent in human serum employed as a diluent in yellow fever vaccine was probably responsible. The yellow fever vaccine now in use does not contain serum and so far has not produced jaundice.

Radiology, Syracuse, N. Y.

41:213-314 (Sept.) 1943

*Preoperative Roentgen Therapy of Breast Carcinoma: Analysis of Histologic Reaction and Roentgen Technic. D. S. Dann and R. Koritschoner.—p. 213.
Radiation Therapy in Carcinoma of Rectum and Sigmoid: Experimental Study of "Danger" Dose of Roentgen Rays for Intestinal Mucosa in Dogs and Analysis of 195 Cases Treated in State of Wisconsin General Hospital During 1928-1938. E. A. Pohle and B. K. Lovell.—p. 225.
Radiologic Exploration of Sinus Tracts, Fistulas and Infected Cavities. H. C. Gage and E. R. Williams.—p. 233.
Roentgen Therapy for Bronchogenic Carcinoma. E. T. Leddy.—p. 249.
Radium Treatment of Granular or Hypertrophied Lateral Pharyngeal Tonsillar Bands. R. E. Fricke and F. N. Pastore.—p. 256.
Giant Cell Tumors: Radiation Therapy and Late Results. J. Gershon-Cohen.—p. 261.
Roentgen Therapy of Orbital-Pituitary Portals for Progressive Exophthalmos Following Subtotal Thyroidectomy. F. B. Mandeville.—p. 268.
Protection in Radiology: An Exhibit. Edith H. Quimby and J. Pool. —p. 272.
Types of Pulmonary Tuberculosis Which Demand Disqualification for Active Duty in Navy. C. H. Warfield.—p. 282.
Some Considerations of Wartime Radiology in Navy. C. F. Behrens. —p. 284.
Federal Regulations Affecting Allocation of X-Ray Equipment and Supplies. R. K. Myers.—p. 288.

Preoperative Roentgen Therapy of Breast Carcinoma.—Analysis of 12 cases by Dann and Koritschoner reveals that complete sterilization of carcinoma of the breast and axillary nodes by fractionated irradiation has not been accomplished. Irradiation brings about a definite reduction in the size of the tumor and pronounced regressive changes, which may be due to the enhancement of the natural defensive reaction of the host. Operable carcinoma of the breast should be treated by radical amputation. The additional benefit derived from preoperative irradiation of operable carcinoma remains to be established. Inoperable carcinoma may become operable after irradiation. Radiation therapy is recommended in inoperable carcinoma, operable carcinoma for which operation is refused and operable carcinoma with physical conditions contraindicating operation. Further studies of the individual factors governing irradiation may disclose an improved technic for the treatment of carcinoma of the breast. The authors suggest that a comprehensive centrally controlled plan of investigation be inaugurated to establish the precise value of radiation therapy of breast carcinoma.

South Carolina Medical Assn. Journal, Florence

39:175-204 (July) 1943

Some Problems of Allergy in Childhood. B. N. Miller.—p. 175.
Review of and Case Report of Rocky Mountain Spotted Fever. E. L. Power and M. J. Boggs.—p. 180.
Observations in Shock Therapy. C. J. Milling.—p. 182.

39:205-224 (Aug.) 1943

Endoscopy: Review of Cases. R. W. Hanckel.—p. 205.
Suppurative Appendicitis: Case Report. R. M. Pollitzer.—p. 209.
Lymphoepithelioma. G. R. Laub.—p. 210.

Southwestern Medicine, Phoenix, Ariz.

27:163-184 (July) 1943

Herniation of the Intervertebral Disk (Fundamentals of Diagnosis and Treatment). J. M. Ovens.—p. 163.
Common Errors in Orthopedic Surgery. J. L. Smith.—p. 171.
Gallbladder Disease. W. W. Haggart.—p. 173.

Tennessee State Medical Assn. Journal, Nashville

36:289-328 (Aug.) 1943

Medical Aspects of Chemical Warfare as Related to Civilian Defense. R. M. Powell.—p. 289.
Traumatic Pseudocyst of the Pancreas. C. Harrison and F. Cooper. —p. 299.
Certain Complications of Treatment. A. Weinstein.—p. 305.
Surgical Treatment of Peptic Ulcer. G. T. Howard Jr.—p. 310.
Acute Abdominal Symptoms Resulting from Black Widow Spider Bite. H. Wilson.—p. 314.

War Medicine, Chicago

4:247-362 (Sept.) 1943

Ophthalmic Injuries of War. J. L. Matthews.—p. 247.
Atmospheric and Immersion Blast Injuries. F. V. Theis.—p. 262.
War Neuroses After Air Attack on Oahu, Territory of Hawaii, Dec. 7, 1941.—p. 270.
Clinical Toxicity of Atabrine Dihydrochloride (Quinacrine Hydrochloride U. S. P. XII): Controlled Comparative Study of Toxicity of American and of Foreign Atabrine When Administered in Doses Commonly Employed in Prophylaxis of Malaria. E. H. Loughlin, R. H. Bennett, E. Santora and S. Mattucci.—p. 272.
Measurement of Vibration Sense: Method and Means. A. Roth.—p. 280.
Comparison of One Hundred Army Psychiatric Patients and One Hundred Enlisted Men. E. G. Billings, F. G. Ebaugh, D. W. Morgan, L. I. O'Kelly, Genevieve B. Short and F. C. Golding.—p. 283.
*Primary Pulmonary Coccidioidomycosis: Report of Epidemic of 75 Cases. D. M. Goldstein and S. Louie.—p. 299.
Effect of Adrenal Cortical Extract on Altitude Tolerance of Normal and of Adrenalectomized Rats. A. E. Johnson, M. Eckman and B. E. Lowenstein.—p. 318.
Spontaneous Pneumothorax. G. H. Stein, E. B. McConkie and A. J. Kuehn.—p. 324.
*Night Blindness of War. P. H. Wosika.—p. 331.

Primary Pulmonary Coccidioidomycosis.—Goldstein and Louie state that primary pulmonary coccidioidomycosis is a relatively uncommon but important infection. It is uncommon because its etiologic agent, Coccidioides immitis, must exist under certain climatic conditions which, according to present knowledge, occur in this country only in certain western states, notably California and Arizona. It is important because the disease is protracted despite its excellent prognosis. This importance becomes manifold at the present time because of the presence of many troops in or near areas where it is endemic. With the current flux of troops, bearing in mind the incubation period, one cannot emphasize too pointedly that this entity may present itself to the medical officers in foreign and in domestic stations aside from the regions where it is endemic. The authors report an epidemic of 75 cases of primary pulmonary coccidioidomycosis. The history reveals exposure in a region where coccidioidomycosis is endemic, with symptoms of pain in the chest, chills, fever and cough. Positive physical findings may or may not be present, but they are not in themselves diagnostic. It is suggested that cervical adenopathy with sore throat but without a pharyngitis may be an early characteristic of this disease. A positive cutaneous reaction to coccidioidin and x-ray appearances aid in establishing the diagnosis. A conclusive diagnosis is made by cultures of sputum and by serologic tests. The prognosis is excellent. Treatment is symptomatic; emphasis is placed on rest in bed, adequate intake of fluids, high calory and high vitamin diet, sedatives and analgesics. The sedimentation rate was the primary factor in the determination of the resumption of activity by the patient; an arbitrary standard requiring a sedimentation rate of 15 mm. or less in sixty minutes with complete absence of symptoms was established as the point at which a patient was allowed out of bed. Convalescent blood from two donors with high precipitin titers was used for transfusion of 2 patients who were critically ill. Both patients demonstrated immediate clinical improvement after the transfusions. Evaluation of this type of therapy cannot be deduced from these 2 isolated instances.

Night Blindness of War.—According to Wosika, night blindness of war was first reported during the Crusades and since that time almost all major military efforts have been accompanied by night blindness, particularly wherever overstraining, heat, sun blinding, hunger and thirst have occurred. The first world war was responsible for much literature on this subject. The term night blindness of war embraces organic and idiopathic night blindness. In the literature poor dark adaptation as measured by instruments also has been included under this term. Malnutrition (lack of vitamin A) causes night blindness, xerosis and xerophthalmia. Therapeutic correction is simple, swift and sure. Poor dark adaptation does not seem related to night blindness, xerosis, xerophthalmia or food adequacy. Therapeutic correction is not successful even with huge supplemental doses of vitamin A. In the present state of knowledge of scotopic vision, night blindness and poor adaptation must be differentiated. It is suggested that further work with the rate and end values of dark adaptation concerning rods, cones and influences of the nervous system be performed in an attempt to establish a firm physiologic basis for dark adaptation tests. While dark adaptation tests do measure the ability to see in low luminosity, the controlling mechanism is not established, the relation to vitamin A is not clear and its usefulness in military medicine as regards night blindness of war must be questioned, although further refinements of technic may enhance the value of the test.

Wisconsin Medical Journal, Madison

42:881-1004 (Sept.) 1943

*Trichinosis Epidemic in Rock County. T. L. Vogel.—p. 909.
New Prophylactic Measures in Tetanus. C. N. Neupert.—p. 916.
Treatment of Civilian War Injuries. W. H. Cole.—p. 918.
Colloid Carcinoma of Gastrointestinal Tract: Occurrence in Boy Twelve Years Old with Production of Pseudomyxoma of Peritoneum. J. M. King and J. J. Satory.—p. 925.
Thirty-Five Year Survey of Appendicitis in Rock County. T. J. Snodgrass, W. A. Munn and T. Flarity.—p. 928.
Thymic Tumor in Myasthenia Gravis: Case Report. E. Haynes.—p. 932.

Trichinosis Epidemic.—A man complaining of muscle pain, swollen jaws and puffy eyes following a gastrointestinal upset was admitted to a Janesville hospital. A routine blood smear showed eosinophilia and suggested trichinosis. It was discovered that many members of the neighboring community were afflicted with similar complaints. The epidemic involved 28 patients from 13 families. There was a history of eating summer sausage obtained from a local butcher and followed in a week by illness. The sausage was made from contaminated pork. Since summer sausage is not treated by cooking or refrigeration, the encysted larvae were not killed. Symptoms referable to the gastrointestinal tract, the eyes and the muscles predominated. Chills and remittent fever with signs of meningeal irritation were common. Cardiovascular signs, weight loss and cough were observed. The blood picture showed eosinophilia, the curve paralleling the course of the disease. Relative lymphopenia was common. Blood calcium was low in 2 cases. The acute phase lasted three or four weeks, with residual symptoms of weight loss, weakness and eosinophilia. Purging with castor oil and calomel was of doubtful benefit; it was probably started too late to be effective. Cod liver oil and calcium, with some parathyroid injection, were given in large doses in 1 case. Despite the low blood calcium, only 4.8 mg. in 1 case and in another 4.4 mg., those without treatment did as well as those with it. No anemia developed, though the red blood cells fell a few hundred thousand in the cases studied.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

66:89-162 (June) 1943

Afferent Areas in Brain of Ungulates. E. D. Adrian.—p. 89.
Mode of Representation of Movements in the Motor Cortex, with Special Reference to "Convulsions Beginning Unilaterally" (Jackson). F. M. R. Walshe.—p. 104.
Indirect Injuries of Optic Nerve. J. W. A. Turner.—p. 140.
Reflex Studies in Electrical Shock Procedure. F. F. Kino.—p. 152.

Journal of Royal Army Medical Corps, London

81:1-50 (July) 1943

Case Showing Unusual Effects of Trauma. J. V. Wilson.—p. 1.
*Smallpox Treated with Sulfanilamide. J. D. Cottrell and H. T. Knights.—p. 7.
Survey of Methods of Treatment of Tropical Ulcers. A. F. McGill.—p. 16.
Occupational Therapy for Psychoneurotics in Hospital. J. F. Wilde and C. J. Morgan.—p. 24.
"Phenol and Camphor" Treatment of Ringworm of Glabrous Skin: An Interim Report. G. G. Waldin.—p. 32.

Smallpox Treated with Sulfanilamide.—Cottrell and Knights report observations in 11 cases of smallpox which they observed in the course of a civilian epidemic of the disease, which occurred in an area in the Middle East Command. In the area in which the majority of the reviewed cases occurred, there were reported 444 cases, a figure estimated to represent about one third of the total incidence. The estimated mortality was about 20 per cent. Nine of the 11 cases occurred among British troops; the other 2 involved one of the authors and a Nursing Sister. In 4 of the 11 cases no vaccination scars could be detected. Of these 4, 3 were fatal. In all the others there were good "baby" scars. It is considered that the effect of a good "baby" vaccination is sufficiently long lasting demonstrably to modify the effect of an attack of smallpox occurring twenty to thirty years later. The treatment consisted in addition to general and symptomatic measures of administration of sulfanilamide. Treatment was commenced as soon as the vesicular stage was reached, and the average total dose was 22.5 Gm. given over six days. The main, if not sole, effect of the sulfanilamide appeared to be the reduction of complications due to pyogenic organisms; no effect was detected on the essential virus. There was definite mitigation of suppuration in the skin lesions, a lessening of ocular complications and a reduced incidence of pulmonary complications. Instead of a true pustular stage there was a vesicular stage in which the vesicular fluid was slightly milky and not yellow even in cases with a fatal outcome. The process was later one of desiccation and desquamation rather than of the classic pustulation and scabbing.

Lancet, London

2:179-210 (Aug. 14) 1943

*Toxicity of Tannic Acid: Experimental Investigation. G. R. Cameron and R. F. Milton and J. W. Allen.—p. 179.
Formation of Red Blood Corpuscles. F. Duran-Jorda.—p. 186.
Bone Grafting in Treatment of Fractured Tibia and Fibula. J. R. Armstrong.—p. 188.
Delayed Recovery from Trilene Anesthesia. S. F. Durrans.—p. 191.
Clinical Signs of Diphtheria in Inoculated Children. C. Neubauer.—p. 192.

Toxicity of Tannic Acid.—Cameron and his associates report an experimental investigation into the toxicity of tannic acid and the chances of its absorption from burned areas. Some information about the fate of tannic acid after it reaches the circulation is given and contrasted with the behavior of gallic acid. Experiments have been carried out on goats, rabbits, guinea pigs and rats, 250 animals being used in all. Tannic acid was obtained from seven different firms, but one sample was employed for most of the experiments. This sample contained about 20 per cent gallic acid. The authors present experimental evidence that in animals tannic acid has injurious effects on the liver, capillaries and possibly on the bone marrow. After the introduction of small amounts of tannic acid directly into the blood stream or large amounts into the subcutaneous tissues, animals show centrolobular necrosis in the liver, increased capillary permeability with leakage of plasma into the subcutaneous tissues, peritoneum and occasionally the lungs, and leukocytosis. Production of a reservoir of tannic acid in the tissues, as by subcutaneous injection, leads to continued absorption of small amounts into the blood and a serious intoxication. Tanning a burnt surface may also be followed by absorption of tannic acid. With lapse of time the continuous bathing of the liver cells with blood containing tannic acid results in damage and destruction of certain tissues. The injurious effect cannot be attributed to gallic acid, which is rapidly removed from the blood and can be tolerated in large amounts. The authors point out that the chief criticism of tannic acid treatment of burns comes from the experimentalists. Caution must be exercised in applying to man without discrimination conclusions reached by the study of animals. They recognize that the ultimate decision for or against the tannic acid method must come from human experience, and they note that evidence is already accumulating which suggests the need for critical revision of this treatment.

An. Cáted. de Pat. y Clín. Tuberc., Buenos Aires

4:5-205 (June) 1942. **Partial Index**

Allergy in Experimental Tuberculosis. A. R. Arena.—p. 72.
Michailow Test in the Diagnosis of Activity in Tuberculosis. R. F. Vaccarezza, J. C. Rey, S. F. Erdstein and B. Enquin.—p. 89.
*Results of Artificial Pneumothorax Plus Pneumolysis in 300 Cases of Pulmonary Tuberculosis. R. F. Vaccarezza and F. A. Medici.—p. 111.
*Relation of Tuberculous Meningitis to Organic Focal Tuberculosis R. F. Vaccarezza, F. C. Tucci, and J. B. Gómez.—p. 146.

Artificial Pneumothorax and Pneumolysis.—Vaccarezza and Medici state that artificial pneumothorax should be instituted early in the course of pulmonary tuberculosis. When pneumolysis is necessary it should be done three or four months after the pneumothorax. The Jacobaeus-Maurer type of operation is the most satisfactory. In 300 cases of pulmonary tuberculosis treated by this method and followed for a period of from one to three years, good results were observed in 77.3 per cent. This figure includes cases reported as apparently cured as well as those with a favorable course. There was no surgical mortality. Later in the course of the disease 7.3 per cent of the patients died. The efficiency of pneumothorax combined with pneumolysis is dependent on how early collapsotherapy is instituted and on the completeness of the collapse obtained.

Tuberculous Meningitis and Focal Tuberculosis.—The study of 90 patients of different ages with tuberculous meningitis showed that it constituted an isolated process in 34.4 per cent and was associated with focal lesions in 65.6 per cent. Focal pulmonary tuberculosis was present in 53.3 per cent. Of these cases 25.5 per cent were primary, 47.7 per cent secondary and 26.6 per cent tertiary tuberculosis. The infant was much more subject to the development of meningitis. Roentgenologic examination revealed fresh lesions of primary infection in 42.2 per cent, calcified lesions of primary infection in 11.1 per cent, juxtahilar infiltration in 6.6 per cent, fresh or calcified miliary shadows in 86.7 per cent and tertiary pulmonary tuberculosis in 26.4 per cent. In no case did the x-rays reveal a "healthy" lung.

Arch. Lat. Amer. de Card. y Hemat., Mexico., D. F.

13:51-88 (March-April) 1943. **Partial Index**

*A Study of Liver Function in Cardiac Insufficiency. I. Chávez, B. Sepúlveda and I. A. Ortega.—p. 51.
Diagnostic Clues in Cardiovascular Clinic. P. D. White.—p. 81.

Liver Function in Cardiac Insufficiency.—Chávez and his co-workers studied the liver function of 35 patients with heart disease, 30 of whom were decompensated. An increase of blood bilirubin and urobilinogen in the urine and a retention of bromosulphalein was observed in all patients with cardiac insufficiency. There was a very close correlation between the degree of liver dysfunction and the severity of heart insufficiency. In the compensated cardiac patients the liver tests were, as a rule, normal. In those with cardiac decompensation the blood bilirubin and urinary urobilinogen returned to normal and the bromosulphalein gave normal results when compensation was reestablished.

Bol. Inst. de Med. Exper. p. Cáncer, Buenos Aires

19:419-818 (Dec.) 1942. **Partial Index**

Experimental Cancer Produced by Tobacco Tar: Spindle Cell Sarcoma. A. H. Roffo.—p. 503.
*Tar from Extracted Tobacco and Decrease of Cancerization. A. H. Roffo.—p. 431.
Experimental Gastric Cancerization by Ingestion of Oxidated Fats. A. H. Roffo.—p. 503.
Female Sex Hormone in Precancerous States: Its Determination in Fibroadenoma. A. H. Roffo and A. E. Roffo Jr.—p. 559.
*Ultra High Voltage Roentgen Therapy (400 to 600 Kilovolts): Report of 2 Cases of Mediastinal Tumor Treated with Favorable Results. A. H. Roffo and A. E. Roffo Jr.—p. 587.
Rapid Disappearance of Recurrent Spindle Cell Sarcoma Treated with Ultra High Voltage Roentgen Therapy (400 Kilovolts). A. H. Roffo and A. E. Roffo Jr.—p. 599.
Roffo's Reaction in 36,961 Patients: Statistical and Clinical Results. B. G. Stuckert.—p. 629.
Cancer Mortality in City of Buenos Aires During 1941. A. H. Roffo. —p. 645.

Extraction of Tar from Tobacco.—Roffo shows that the extraction of tobacco with organic solvents such as alcohol, chloroform, acetone, petroleum ether, paraffin and benzene removes from it substances generating carcinogenic hydrocarbons which are to be found particularly among the phytosterols. The cancerigenic action of these extracted tars has been slight when compared with that of whole tars. Smokers could be provided with tobacco the tar content of which would have only slight cancerigenic action, but because the extracted tobacco would have lost much of its taste the author considers it doubtful that the tobacco would be acceptable.

Ultra High Voltage Roentgen Therapy for Mediastinal Tumors.—The Roffos report *2* instances of ultra high voltage roentgen therapy. The first patient was a girl aged 18 with a large lymphosarcoma of the mediastinum and a metastasis in the lumbar vertebral column. She was treated with 600 kilovolts, receiving two series of 6,040 and 6,174 roentgens respectively. A year and seven months after completion of the treatment the patient was found cured clinically and roentgenologically. The second patient was a man aged 33 with a large mediastinal tumor and abdominal and lumbar metastases. He too was found well one year after treatment with ultra high voltage roentgen therapy.

Deutsche medizinische Wochenschrift, Leipzig

68:105-132 (Jan. 30) 1942. **Partial Index**

*Prognosis of Arterial Hypertension. W. Weitz.—p. 105.
Hypertension as Cerebral Function. A. Sturm.—p. 110.
Vegetative Nervous System and Immunity. L. Goreczky.—p. 114.
*Therapeutic Attempts to Promote Local Blood Perfusion of Tissues in Varicose Crural Ulcers. Käte Pezold.—p. 116.
Successful Roentgen Irradiation in Case of Pulmonary Echinococcus. H. Brodersen and A. Buding.—p. 118.

Prognosis of Arterial Hypertension.—Weitz is concerned with a condition which Volhard designates as red hypertension. With the same degree of hypertension the threat to life is greater in younger than in older persons. The highest level of the mortality curve for persons with hypertension is about ten years below that of persons with normal blood pressure. The prognosis is to some extent determined by the treatment, particularly by the degree to which the patient follows the regulations of his mode of living. An enlarged heart indicates that hypertension has existed for some time, but, as a physiologic result, it does not make the prognosis more unfavorable. A systolic murmur over the apex is more frequent when there is insufficiency, but it is of no prognostic significance if other symptoms are absent. A rapid pulse is an unfavorable prognostic sign. Occasional extrasystoles are of no particular importance, but pulsus alternans is an unfavorable sign. The presence of cardiac insufficiency causes stasis in the pulmonary circulation and may signify relative insufficiency. Urinary changes (protein, erythrocytes and casts) indicate an unfavorable prognosis. Changes in the fundus oculi is a serious sign in patients with hypertension. Cerebral defects manifested by impairment of memory, neurasthenia and irritability indicate an unfavorable prognosis. A history of syphilis, the presence of obesity and diabetes render the prognosis less favorable.

Therapy of Varicose Crural Ulcer.—Pezold stresses that only those measures constitute a causal therapy of crural ulcer which counteract the pathologic blood perfusion of the lower extremity that exists in this condition. At the dermatologic clinic of the University of Berlin emphasis is placed on the dietetic treatment of Bommer, which provides large amounts of fruit juices, fruits and vegetables, and on physical therapy. The administration of adenosine triphosphoric acid and of ovarian extracts served as supporting measures. These latter substances promoted the therapeutic effects of the other treatments but had no effect when given alone. The author reviews observations on *25* women with varicose crural ulcers. Some were treated with Bommer's diet, hydrotherapeutic measures and the aforementioned supporting measures, others only with diet and hydrotherapy, and still others only with glandular extracts. The results were most favorable in the first group. The endocrine substances alone were without noticeable influence.

Münchener medizinische Wochenschrift, Munich

89:1-24 (Jan. *2*) 1942. **Partial Index**

*Observations on Sudden Heart Death. H. Zettel.—p. 1.
What Every Physician Should Know About Rectal Cancer. Gulcke. —p. 7.
Treatment of Sweat Gland Abscesses. H. J. Lauber.—p. 11.

Sudden Heart Death.—Zettel reports the clinical histories and the postmortem findings of 14 patients, a number of them soldiers, who died suddenly. There were *2* cases of rupture of the aorta (one a ruptured aneurysm), 5 cases of valvular lesions or endocarditis and myocarditis, and 7 cases of coronary changes. The patients were exceptionally young, their ages varying between *22* and 47 years. In addition to the organic changes, functional factors played a part as eliciting causes in the sudden heart deaths. The question of impairment by military service is discussed. Careful attention should be given to the presence of circulatory disorders during the preinduction examination. Functional tests of the heart should be included in the general examination. In deciding the suitability for flying service, electrocardiographic studies should be made.

Zentralblatt für Bacteriologie, Jena

148:1-64 (Nov. 5) 1941. **Partial Index**

Serum Against Hoof and Mouth Disease and Its Production. O. Waldmann, G. Pyl, K. O. Hobohm and H. Mählmann.—p. 1.
*Successful Transmission of Poliomyelitis Virus from Human Subjects to Ferrets. F. Patočka.—p. 15.
Infection Experiments on Various Intermediate Hosts of Bilharzia with a Single Miracidium of Bilharzia Mansoni and B. Japonica. H. Vogel. —p. 29.
Cause of Rugate Growth Forms and of Phenomenon of Disintegration in Pseudomonas Pyocyanea. S. Fiala.—p. 58.
Human Amniotic Fluid as Bacterial Nutrient Medium. S. Roufogalis. —p. 61.

Transmission of Poliomyelitis Virus from Human Subjects to Ferrets.—Patočka reasoned that it would be desirable to find an animal other than the monkey for the transmission of the human virus, for this would make possible the production of vaccines for preventive immunization. The monkey virus is too close to the human and consequently is too dangerous for use in human subjects. The author took advantage of the poliomyelitis epidemic of October 1939 and inoculated a number of ferrets intracerebrally with the spinal cord tissue of fatal cases of poliomyelitis. In three different instances in which material was obtained from rapidly fatal cases ferrets developed fever, paretic symptoms and paralytic symptoms. Two ferrets died with symptoms of poliomyelitis. From one of these the virus could be transmitted to a second ferret, which died with the same symptoms after a longer period of incubation. Rabbits, guinea pigs and mice which were inoculated simultaneously with the ferrets failed to develop signs of the disease. Further studies excluded the possibility that the ferrets suffered from a nonspecific irritation of the central nervous system caused by heterogenous spinal substance or from a spontaneous ferret encephalitis. The spinal cord of the ferrets showed considerable degeneration of the motor cells of the gray spinal substance, but the inflammatory changes were not quite adequate for poliomyelitis. The author explains this by the fact that the virus had taken root in a less susceptible species of animal. He admits that his experience was exceptional and that it will probably not be possible to transmit regularly the virus of human poliomyelitis to ferrets. The exceptional virulence of the virus was probably responsible for the successful transmission.

Book Notices

The Etiology of Delinquent and Criminal Behavior: A Planning Report for Research. By Walter C. Reckless. Bulletin 50. Paper. Price, $1.50. Pp. 169. New York: Social Science Research Council, 1943.

In this interesting monograph the author attempts an evaluation of the important contributions and theories on the causes of criminal behavior and suggests a plan for further research. "The present monograph then may be looked on as an attempt to promote unified effort by the different disciplines—psychiatry, psychology and sociology—engaged in the study of the causes of delinquency and criminal behavior." In the complex field of criminology, heredity, subnormal intelligence, mental abnormality, endocrines, physical types and mental types, i. e. "typical criminal," have been offered as the deciding factors largely by psychiatrists and other physicians. Sociologists, on the other hand, have emphasized economic conditions, environmental conditions, family situations and exposure to crime, to name a few of the factors held responsible for conflict with the law. The author describes each of these hypotheses and attempts to point out the fallacy of attempts to give them as the sole cause of crime or in some instances to have anything to do with criminal behavior. Throughout the manuscript, emphasis is placed on the author's view that none of the views which have been advanced to date can be accepted as the solution to the problem, but it is obvious that his prejudices favor sociological explanations. He proposes more controlled mass studies as the line of research most likely to give results. In this attempt it is assumed that exhaustive psychiatric studies to all individuals in the group could be added to the environmental data to be collected. This monograph is a valuable contribution to the field of criminology in its effort to bring together research work carried on to date with provocative opinions as to the value of each theory.

A Critical Analysis of Collapse in Underground Workers on the Kolar Gold Field. By Anthony Caplan, M.D., M.R.C.P. Reprinted from Bulletin No. 54 of the K. G. F. Mining and Metallurgical Society. Paper. Pp. 95, with 12 illustrations. Marikuppam P. O., Kolar Gold Field, India: T. Williams, 1942.

This is a discussion of the results of an investigation of the mechanism of heat collapse and its contributory causes in the Ooregum, Mysore, Champion Reef and Nundydroog mines of the Kolar Gold Field from Nov. 18, 1939 to Nov. 17, 1941. The factors observed that may have influenced the incidence of heat collapse were individual, seasonal and underground. Individual factors were determined by a careful history and physical examination of all cases (293) of alleged collapse in underground workers admitted during the two years to the Kolar Gold Field Hospital, irrespective of the mildness of the condition or its cause. Seasonal factors were determined by information on surface conditions obtained from the Kolar Gold Field Observatory. Information on underground factors, such as wet and dry bulb temperatures, humidity and velocity of air at the working places, was obtained from the mine superintendents.

The patients were classified into three groups according to whether their collapse was due entirely to underground conditions, partly to underground conditions and partly to individual factors, or collapse was absent or unrelated to underground conditions. Two types of cases were determined clinically—mild, and moderate and severe.

The most interesting data deal with the 200 cases in the second group, in which the individual factors were unacclimatization, loss of acclimatization and disturbances of health. An unexpected lower incidence of collapse among unacclimatized new employees shows that acclimatization to hotter underground atmospheres existing on deeper levels cannot be developed by many months of continuous work on the cooler levels. Loss of acclimatization appeared to be much more important in predisposing to heat collapse than unacclimatization. The health disturbances that predisposed to collapse were febrile illnesses, after-effects of celebrating festivals, food intake and nutrition, and water and chloride deficiency.

The pathologic physiology of collapse is discussed in terms of changes in the cardiovascular system, and water and chloride metabolism. Many of the symptoms of collapse could be attributed to chloride deficiency. An interesting feature was the correlation of the incidence of collapse with the rise and fall of surface dry and wet bulb temperatures and humidity, which was clearly established and provided positive evidence of the deleterious effect of high surface humidity.

The great importance of ventilation is emphasized by the occurrence of collapse most frequently below 5,000 feet in dead ends supplied with upcast air of low velocity. It is stated that, provided the dry bulb temperature is 110-120 F., a wet bulb of 90 F. or under denotes good ventilation and comfortable working conditions, 91-93 borderline working conditions, 94-95 poor ventilation, and 96 or over conditions highly conducive to collapse. The occurrence of collapse depended more on the nature of the working conditions than on the character of the work.

The problem of the mining engineer is to prevent the wet bulb temperature at the face rising above 93 F. The value of air refrigeration is demonstrated by the dramatic fall in the incidence of collapse in the Champion Reef mine after installation of the air conditioning plant and the general low incidence, throughout the two year period, of collapse in the air conditioned Ooregum mine. It is stated that surface air conditioning plants will reduce the incidence of heat collapse for some years, but with further development of the mines it again will become a major problem, taxing the ingenuity and resourcefulness of the mining engineer.

The Human Eye in Anatomical Transparencies. Explanatory Text. By Peter C. Kronfeld, M.D., Director of Education, The Illinois Eye and Ear Infirmary, Chicago. Anatomical Transparencies. By Gladys McHugh, Medical Illustrator, University Clinics, The University of Chicago. Historical Appendix. By Stephen L. Polyak, M.D., Professor of Anatomy, The University of Chicago. Fabrikoid. Price, $6.50. Pp. 99, with illustrations. Rochester, New York: Bausch & Lomb Press, 1943.

A new method of graphic representation, namely three dimensional illustration on cellulose acetate, is utilized in this volume to present the finest representation of the anatomy of the eye thus far available. A series of paintings showing serial dissections of the eye and orbit from the front and from the side at twice natural size has been prepared by Miss Gladys McHugh and republished on cellulose acetate so that one can actually see the anatomy of the eye layer by layer. The colors are natural and have been faithfully reproduced except in the case of veins and nerves, which have been made blue and yellow to distinguish them from the arteries. The text prepared by Dr. Peter C. Kronfeld gives a detailed study of anatomy of the eye and in addition a most complete description of the anatomy as shown in Miss McHugh's illustrations. Finally the book includes a history of anatomic illustration of the eye by Dr. S. L. Polyak, a real contribution to medical history on a par with previous histories of medical illustrations such as that of Mortimer Frank. Every ophthalmologist and every teacher, particularly of the anatomy of this subject, will find this book invaluable. Indeed it is reported that the demand is already well beyond the available supply.

Pharmacology, Materia Medica and Therapeutics. By Charles Solomon, M.D., F.A.C.P., Associate Attending Physician and Chief of the Medical Clinic, Jewish Hospital of Brooklyn. Collaborator: Hazel Houston, M.A., R.N., Instructor in Materia Medica, School of Nursing, Bellevue Hospital, New York City. Fifth edition. Cloth. Price, $3.25. Pp. 823, with 91 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1943.

The author of Proverbs said "With all thy getting, get understanding." The authors of this book assume that the student nurse has ability and time to become omniscient. They present a pot-pourri complex enough to confuse a witch of Endor. That their presentation aids or gives time for understanding is questionable. They encourage the neophyte with this advice: "The student's mastery of materia medica will be greatly enhanced by her ability to connect the facts and theories in the subject with the facts and theories of related subjects. . . . The student will therefore do well to make an effort to relate what she learns in materia medica with what she has already learned in anatomy, physiology, chemistry and bacteriology." Wonderful words, but even the authors do not live up to them. In a discussion of some of the major present day problems, proprietary medicines receive the conventional condemnation. The authors give a list of the differences in price of proprietary and ethical drugs which is either not understood or is used as propaganda. For example, the difference in the price of aspirin and acetylsalicylic acid is a wholesale price and

does not affect the retail purchaser. They do not give the devil his due. They give a list of some common names for drugs or preparations, such as Basham's Mixture, Brown Mixture, Burow's Solution, Channing's Solution, Clemen's Solution, Dalby's Carminative, Warburg's Tincture and Zambeletti Solution. These names are worse than worthless and their use should receive the same condemnation as proprietary preparations. They retard scholarship by using time and space that should be given to more important subjects. Because the book contains so much unimportant matters, the discussion and explanation of worth-while subjects is limited to brief and unsatisfactory statements. This applies particularly to the connection of physiology with pharmacologic action, the importance of which they emphasize in the first part of the book but neglect later. The book is clearly written and contains many fine illustrations and a lot of facts not found in many of the better known books on pharmacology. It has an elaborate general index and an index of symptoms of most diseases.

The Medical Use of Sulphonamides. Medical Research Council War Memorandum No. 10. Paper. Price, 25 cents; 9d. Pp. 66. New York: British Information Services; London: His Majesty's Stationery Office, 1943.

This booklet is a concise presentation of the present status of the sulfonamide compounds with a maximum of facts and a minimum of wasted words. The pages are crammed with information presented in a manner especially suitable for those who wish an accurate view of these agents without encountering confusing and freqnently questionable details. The contents encompass an introduction and discussions on chemistry, pharmacology, general considerations governing the use of sulfonamides, questions of supply (in Great Britain), general scheme of dosage, regulation of dosage by the sulfonamide content of the patient's blood, treatment of specific infections, toxic reactions to sulfonamides, estimation of the concentration of sulfonamides in body fluids, bacteriologic studies and sterilization of sulfanilamide powder.

This memorandum has been prepared for the Therapeutic Requirements Committee (appointed by the Medical Research Council) by several well known authorities. Their attitude and conscientious approach to the subject is made evident by their preference for recognized nomenclature, "To avoid confusion and difficulties in supply, sulphonamide drugs should not be ordered or prescribed by proprietary or brand names," and prescribing in terms of the metric system, "Doses should be ordered and recorded in terms of grammes and not in terms of tablets, since not all the sulphonamide tablets issued commercially are of standard 0.5 gm. content." The plea for use of recognized nomenclature is refreshing in a country where trade names are rampant, and should be well received and encouraged. The contributors list names under which sulfanilamide is sold or described; the number is greater than fifty for this single drug, an excellent reason for the use of scientific nomenclature.

An Atlas of Anatomy in Two Volumes. By J. C. Boileau Grant, M.C., M.B., Ch.B., Professor of Anatomy in the University of Toronto, Toronto. Volume I: Upper Limb, Abdomen, Perineum, Pelvis, and Lower Limb. Cloth. Price, $5. Pp. 214, with 227 illustrations. Baltimore: William Wood & Company, 1943.

Up to the year 1900 gross anatomy was the major study of preclinical medicine. There was ample time for it. Students dissected the body more than once. Atlases were of great help, and those then made corresponded with the practice of repeated dissection. They were "systematic," showing the bony, muscular, vascular and nervous systems separately. Now the time available for dissection is reduced. Only one dissection is possible. Grant's regional atlas is adapted to this change. Its illustrations show all the "systems" in each region. So the drawings are fewer. Spalteholz has over a thousand, Toldt over fifteen hundred. Grant covers all but the head, neck and thorax with two hundred and twenty-seven. The drawings are accurate and instructive, being carefully made from special preparations. They show more "relations" than did the older atlases, and the atlas is less expensive. The legends under some drawings are in one or two instances puzzling; e. g., on page 83 is "A stage in the exposure of the (common) bile duct, embryological approach." On page 87 are drawings of variations in the bile duct with the legend "Precocious bile passages." The atlas is good and should prove popular with students.

The Common Form of Niacin Amide Deficiency Disease: Aniacinamidosis. By William Kaufman, Ph.D., M.D. Cloth. Price, $3. Pp. 62. Bridgeport, Conn.: The Author, 1943.

"Aniacinamidosis" is proposed as the name of a disease which the author characterizes by the syndrome resulting from a deficiency of niacinamide as determined by an original "office study" of "more than 150 patients." No laboratory studies were made and no illustrations are included. The symptoms of the disease, as well as its pattern, are stated in detail. A symptom was not considered as characteristic of the disease unless it appeared in at least 30 of the patients studied, disappeared following niacinamide therapy, and reappeared on cessation of therapy. The book is valuable in that it lists the symptoms which may result from a niacinamide deficiency. However, neither the single symptoms listed nor the entire syndrome are sufficiently unique or characteristic for the disease to warrant a positive diagnosis on their presence in a patient. The book leaves the impression that niacinamide deficiencies are vastly more prevalent than generally believed and that the daily requirements of man are considerably higher than those indicated by legal regulations. The author rightly recognizes that a serious weakness in his contribution lies in the absence of objective laboratory studies on his patients. A limited but valuable bibliography is included.

The Australian Army Medical Services in the War of 1914-1918. Volume III. Special Problems and Services. By Colonel A. G. Butler, D.S.O., V.D., B.A. Cloth. Pp. 1,103, with 85 illustrations. Canberra: Australian War Memorial, 1943.

With this volume Colonel Butler completes the task assigned him in writing the history of medical services of the Australian army in the war of 1914-1918. Section I discusses the technical problems of chemical warfare, moral and mental disorders, venereal disease, the influenza pandemic of 1918-1919 and the surgery of repair and rehabilitation. Section II is devoted to the medical services of the naval and the newly created air services. Section III describes dental service, nursing and physical therapy. Section IV continues the story of the invalid soldier, his return home, the medical problems of sea transporation, the reexamination and the technical problem of pensioning. Section V furnishes statistics on the total casualties sustained by all the belligerents. A special feature of this section is a detailed clinical analysis of the figures of mortality and morbidity comprising the life history of the Australian imperial force. The three volumes constitute a valuable contribution to the literature on military medicine.

Problèmes de médecine de guerre. Par Daniel Cordier. Collection "France Forever" sous la direction du Professeur Henri Laugier. Paper. Price, $1.50. Pp. 182, with illustrations. Montréal: Les Éditions de L'Arbre, 1943.

The text is a composite of four articles. They are concerned with the struggle against heat, methods of resuscitation, anesthesia and traumatic shock. The author, who has an international reputation as an experimental physiologist, has presented these subjects critically, clearly and concisely. Although particular emphasis has been placed on the relationships of fundamental physiologic principles to problems peculiar to war, this book would be a valuable addition to the library of the student, the physician and the physiologist. It merits translation.

Air-Borne Infection: Some Observations on Its Decline. By Dwight O'Hara, M.D., Professor of Preventive Medicine, Tufts College Medical School, Boston. Cloth. Price, $1.50. Pp. 114, with 15 illustrations. New York: Commonwealth Fund, 1943.

This little book presents a readable discussion of certain air borne infections with explanations for the decline in incidence of diseases of this group. The book is not closely integrated; it places special emphasis on the experiences of Massachusetts. Neither of these remarks should be interpreted as fault finding, however, since the author makes no claim to exhaustive discussion. Apparently his main purpose in writing this book is to urge that preventive medicine be incorporated to a greater extent in medical practice and that it should not be operated as a detached specialty.

V 1
194

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MANAGEMENT OF VIRUS PNEUMONIA

To the *Editor*:—Please advise me if you know of any treatment that will shorten the period of morbidity for virus pneumonitis infections of the respiratory tract. During last winter we had many cases, most of which acted like the persistent head colds alone or in combination with tracheitis and would persist from three to seven or eight weeks, causing much discomfort. The sulfonamide drugs have no effect on this infection and I have been treating it as we treated colds before the sulfonamide drugs came on the market. John D. Blackburn, M.D., Thomaston, Ga.

ANSWER.—The inquirer is to be complimented on resisting the apparently irresistible urge to give some sulfonamide compound for the common cold and for the virus pneumonias. All who have studied the virus pneumonias carefully agree that chemotherapy is without special benefit. If a view (William Dameshek, THE JOURNAL, Sept. 11, 1943, p. 77) recently expressed is correct, namely that sulfonamide compounds given to certain patients with virus pneumonia may bring about a hemolytic crisis, then chemotherapy for this disease is actually contraindicated.

There is no procedure known which will shorten the period of morbidity of the virus pneumonias. The statement that most cases lasted as long as three to eight weeks is somewhat at variance with general experience and leads one to suspect that some secondary infection like the common cold also affected this group of patients.

Several observers, chiefly roentgenologists, state that roentgen therapy aids in shortening the disease, but in the absence of control cases this must be accepted with reserve. Another group reports beneficial effects from the use of "convalescent" serum, with equally convincing evidence. In view of the apparent multiplicity of causes and of the lack of evidence of beneficial effect of convalescent serum in most other infections, this approach would not seem to be promising. The use of penicillin has been reported in one case without beneficial effect.

In a benign, self-limiting disease, as represented by the majority of the virus pneumonias during the past year, therapeutic restraint should be exercised.

ERADICATION OF FLEAS FROM RESIDENCES

To the *Editor*:—I should like to have some advice on how to eradicate fleas. I have a cocker spaniel and whenever he is kept out of the house for any length of time, such as a vacation, the house becomes infested with fleas. These pests are tiny, black or brown and hard. They hop up from the floor, where they seem to like rugs as their hangout. The bite itches, and twenty-four hours later an intense itching develops that can be relieved only by scratching off the top of the bite with subsequent scarring. I have used pyrethrum, rotenone, sulfur and various other sprays, all to no avail. The companies that do exterminating work say they know of no method that will absolutely eradicate fleas from the house. As long as the dog is in the house there is some decrease in the number of fleas but not enough to help one's peace. Frequent bathing of the dog helps slightly, but the main trouble is getting rid of the fleas in the house. Can you advise me or refer me to some book?

L. M. Harris, M.D., Columbus, Ohio.

ANSWER.—Flea infested premises are largely restricted to those where one or several dogs or cats are kept and where there are suitable places for the propagation of these pests—usually there is a badly lighted basement under the house.

Breeding places for fleas should be eradicated. Basement storage places which are difficult to keep clean may be the first point of attack. After any needed cleanup has been finished, dogs and cats should be removed from the premises for two weeks or more during which period suitable fly sprays that contain pyrethrum may be employed in the house, including the basement or adjacent quarters where fleas may propagate. Ordinary tallow candles may be placed on the floor at night, and these surrounded with sheets of fly paper to aid further in the cleanup.

W. B. Herms (Medical and Veterinary Entomology, New York, Macmillan Company) quotes Skinner, who recommends "sprinkling the floor liberally with about 5 pounds of flake naphthalene and closing the room for twenty-four hours." The acid fumes are said to destroy the fleas in badly infested quarters without material injury.

CONTACT DERMATITIS FROM RAGWEED FAMILY

To the *Editor*:—I am afflicted with dermatitis venenata caused by Iva xanthifolia. The following treatments have been failures: Vaccine made from weeds sent to three laboratories at different times. The last time I took twenty-five hypodermic injections; saturated salicylic acid in alcohol; fluid-extract of Phytolacca (poke root); 10 and 50 per cent balsam of Peru in castor oil; 50 per cent ichthammol in glycerin; wearing a paper sack over my head when I am out and exposed to the weeds; only the exposed parts of the face, neck and hands are affected. I shall be grateful to you for any treatment you may recommend.

M.D., Wyoming.

ANSWER.—Contact dermatitis or dermatitis venenata from Iva xanthifolia or burweed marsh elder, as the weed is usually designated, is not uncommon. Two other members of this genus of the ragweed family, Iva angustifolia (narrow leaved marsh elder) and Iva axillaris (small poverty weed), are also major skin sensitizing weeds. If a patient is allergic to one of these weeds he is usually also sensitive to the other two. The latter plant is a common weed in many section of Wyoming.

Local treatment in weed eczemas is merely palliative, as is the case in contact dermatitis of other origin. If contact with the offending weed cannot be avoided, dermatitis will result and the only relief, until frost or a freeze kills the vegetation and gives temporary respite, will be from local applications. Wet dressings of boric acid, 1:20 Burow's solution or phenolated calamine lotion are as satisfacory topical applications as any.

Varying degrees of relief can be obtained by the desensitizing treatment of the weed sensitive patient with the specific weed oil or oils. These specific oleoresins are usually best administered by the oral rather than the parenteral route.

Before specific therapy is instituted, a weed sensitive patient should be skin tested with all the common weeds in his environment. Weed sensitivity is usually polyvalent, the individual being sensitive to two or more allergenic weeds. Sensitivity to half a dozen or more common environmental weeds is not unusual. Most dermatologists are equipped with acetone extracts of the common weeds for patch testing. Some sixty uncovered tests can be applied in about ten minutes. After a latent period of approximately forty-eight hours skin reactions at the tested sites will reveal the number of weeds to which a patient is sensitive. All weeds giving positive skin tests should be included in the treatment set.

Experience has shown that it requires the ingestion or injection of approximately 2 cc. of a specific weed oleoresin to reduce the sensitivity of a patient from the clinical to the subclinical stage. This amount is realized by the fractional ingestion of 1 ounce each of the 1:100, 1:50 and finally the 1:25 dilution of the oleoresin in corn oil. Oral treatment for weed sensitivity is outlined by Shelmire (Contact Dermatitis from Vegetation: Patch Testing and Treatment with Plant Oleoresins, *South. M. J.* **33**:337 [April] 1940). Oral treatment sets containing the specific weed oils to which an individual is sensitive can be obtained commercially on prescription from the Graham Botanical Laboratory, Route 7, Willow Lane, Dallas, Texas.

Hypodermic injections of the allergenic weed oils cause local reactions unless well diluted, 1:100 or more in some inert vehicle as corn or peanut oil. To obtain a total of 2 cc. of the specific oleoresin it would require some two hundred or more such injections. The ordinary weed sensitive patient has not the fortitude to submit to such prolonged therapy. This is especially true when it is realized that the same amount of allergenic oils can be ingested in a period of approximately three to four months. The amount of absorption of the specific oil is the same, regardless of the mode of introduction into the body.

MORPHINE AND PULMONARY EDEMA

To the *Editor*:—Whee morphine is generally acknowledged to be of considerable benefit in the treatment of pulmonary edema, what is the evidence in support of the contention that this drug is contraindicated in those instances in which the edema results from the action of chemical lung irritants such as phosgene? Lieutenant, M. C., A. U. S.

ANSWER.—Morphine may be of benefit in the treatment of some instances of incipient pulmonary edema. However, there is no adequate evidence that morphine is of benefit in a frank pulmonary edema from any cause, especially if cyanosis (hypoxia) is present. The consensus is against the use of morphine in the treatment of pulmonary edema due to chemical irritants. Most authors state definitely that morphine is contraindicated in pulmonary edema due to phosgene.

In commenting on this subject, Sollmann (A Manual of Pharmacology, ed. 6, Philadelphia, W. B. Saunders Company,

1942, p. 176) recommends that the use of morphine be kept to a minimum (15-20 mg.) and avoided altogether if possible. However, he also emphasizes the importance of rest to the gas casualty and states that the restless and excited patients must have morphine. He points out the fact that small doses of morphine may improve the efficiency of respiration and check coughing that would otherwise add further trauma to the injured lung.

No drug that is a respiratory depressant should be given to the cyanotic patient with pulmonary edema unless required for the relief of severe pain or to prevent the necessity of using physical restraint.

PROBABLE POLYCYTHEMIA VERA

To the Editor:—A white man aged 30 complains of headache, vertigo and red appearance of the face of about a year's duration. He takes two or three "Bromo Seltzers" and several acetylsalicylic acid tablets a week for relief but no other drugs. Essential features of the examination are a reddish, slightly cyanotic appearance of the skin, especially of the face and hands and similar appearance of the mucosa. The blood pressure is 130/90. The retinal veins are full. The weight is 210 pounds (95 Kg.), the height 5 feet 8 inches (173 cm.). He is moderately obese. The heart and lungs are normal. There is a somewhat pendulous abdominal wall but no hepatic or splenic enlargement. Urinalysis and blood Wassermann reaction are negative. Hemoglobin is 120 per cent, red blood count 6,950,000, white blood count 4,700. The differential is normal. Hematocrit (Haden) is 52 per cent with normal control 30 per cent. Coagulation time is four minutes. Information is requested as to whether polycythemia vera is indicated, as no splenomegaly is present. Is splenomegaly necessary for this diagnosis? My feeling is that the one chief requirement in the diagnosis of this disease is splenomegaly. No blood spectroscopic examination has as yet been done to consider a drug or other toxic cause. High altitude is not involved. There is no heart disease. The patient is outdoors most of the time. Although he does some gasoline motor repairs, he does it so infrequently as to make carbon monoxide intoxication unlikely. What further tests should be done for accurate diagnosis of the cause of this polycythemia? Please give best methods of treatment applicable. If an iron deficient diet is indicated, please incorporate in the reply, as no proper library is available here for reference.

M.D., New Jersey.

ANSWER.—The patient has a reddish cyanotic complexion and a cyanotic mucosa. He also has an elevated red blood cell count and decidedly increased hematocrit reading. These are two of the cardinal features for diagnosis of polycythemia "vera." About one fourth of all polycythemia patients fail to show splenomegaly. In some careful studies in a series by Wintrobe 10 per cent of the subjects failed to show splenomegaly. Therefore persons may have this disease without a palpable spleen. The patient described is obese and it might be difficult to determine slight enlargement of the spleen in such a person. In some cases it is of interest to have a flat x-ray film taken of the abdomen to see if some splenic enlargement can be determined. It should be pointed out that it is unusual to find leukopenia in polycythemia as described in this case. However, the increased hematocrit reading as well as the increased red blood cell count would make the diagnosis probable, and therapy might be instituted on the assumption that this is a true polycythemia "vera" or erythremia.

There are four acceptable methods of treatment and they have all given good results in some cases and failed in others. Therefore each therapeutic trial must be judged individually.

1. Irradiation either to the spleen, bone marrow or by spray. Most x-ray therapists are acquainted with these methods.

2. Acetylphenylhydrazine (symmetrical) 0.1 Gm. daily for a week and then this medication given at less frequent intervals until the red blood cell count is between 5 and 6 million. The patient is then kept on a maintenance dose.

3. Phlebotomies, 500 cc. of blood being removed once a week for two or three weeks and the treatment repeated as indicated. Dameshek (THE JOURNAL, Sept. 14, 1940, p. 950) also includes an iron deficient diet requiring the avoidance of red meat, meat soup, liver, eggs, rye bread and brown cereals. Not all hematologists agree with the necessity for maintaining patients on an iron deficient diet.

4. The use of solution of potassium arsenite as described by Forkner and his co-workers (*Arch. Int. Med.* 51:616 [April] 1933).

In the last analysis the physician will have to choose the therapeutic procedure best fitted for the particular patient and the physician's facilities. Moreover, he should be guided not so much by the blood count as by the patient's symptoms. It would be a good idea for the patient to avoid Bromo-Seltzer. Where it is difficult to obtain x-ray therapy or in cases in which the physician is unacquainted with the use of acetylphenylhydrazine or solution of potassium arsenite the safest procedure would be phlebotomies, using the patient's symptoms and blood count as guidance for the frequency of this measure.

EXOSTOSIS FOLLOWING REDUCTION OF DISLOCATED HIP

To the Editor:—On March 13, 1943 a coal miner sustained a traumatic injury to the muscles of his left thigh including a dislocation of his hip joint on the same side. At the time an x-ray examination showed no damage either to the femoral head or to the acetabulum. Reduction was accomplished fairly easily. Now, six months later, in view of this man's continued inability to get about and work, I made a check up picture of him. It shows a good end result on the reduction—symmetrical, no evidence of fracture or any atrophy. It does show, however, a spur, an exostosis, coming off the upper end of the femur directed toward the ischium. This extends out into the muscular spaces. I should like to know if his injury entered into the cause of this extra bone growth. How did this come to be there? Can his disability on account of this exostosis not be excluded from the incident of his injury?

Charles M. Mellen, M.D., Verda, Ky.

ANSWER.—It is not unusual to see something of the sort described in the inquiry develop late after reduction of a dislocated hip, even though the reduction was successful and the x-rays immediately or soon after showed normal anatomic relationship of the head of the femur and the acetabulum. In these cases, for some unknown reason, there occurs bone formation along portions of the capsule, and this process may go on for some months and there is no way to predict just how extensive it will be. No blame can be attached to the method of reduction. The same unfortunate process occurs with fair frequency following dislocations of the elbow. In the hip joint, if the process is not too widespread in the capsule and the new bone is mature, the bone formation can be dissected away. However, it is important that no surgical intervention be instituted until the process is completed and the new bone matured and hard. It is difficult to say just when that period is reached. Certainly a year should elapse before any such dissection is attempted. If done earlier, the bone may promptly reform. A guarded prognosis should be given. In cases in which the involvement is extensive, the condition may eventuate in pronounced disability due to loss of almost all motion. If the patient the subject of the inquiry is handicapped by this bony formation confined to the femur, it should be removed. It probably has to do with inferior border of the capsule and the periosteum of the femur. The formation described is most probably due to the injury if x-ray films taken at the time of reduction showed nothing of the kind present.

EFFECTS OF MENSTRUATION, PREGNANCY AND ANESTHESIA ON PERMANENT WAVES

To the Editor:—In Queries and Minor Notes (THE JOURNAL, July 31, 1943, p. 981), granted that the reference to the figures of Baker are pertinent to the texture of the follicle and the pull required to epilate the hair of the forearm, it appears far fetched to favor the possibility of effect of menstruation, pregnancy and anesthesia on permanent waving. Hair keratinized and erupted beyond the limits of the follicle is outside the sphere of influence of anything taking place inside the body. Only the fresh growing part of the hair, the part of the hair within the depth of the follicle, the part of the hair not yet keratinized is under the influence of body states, as menstruation, pregnancy and so on.

Hairdressers have succeeded tubers in hospitals. The permanent waving department is busy. For many years I reviewed the opinions of a board of hairdressers on problems of permanent waving throughout the country. A great number of professional hairdressers believe that internal conditions affect the success of permanent waving. Few agree that the hair is outside the influence of immediate, recent or concurrent body changes.

The answer to the query permits the careless hairdresser, the hurried technician, the cut rate shop operator too ignorant to give best earth to consult responsible for failures of permanent waving. The prevalence of permanent waving lack fundamental training. They ignore the influence of the molecular structure of hair on permanent wave technic. The work of Astbury, of Astbury and Woods and of Speakman is rarely mentioned in the textbooks of the trade. The chapter on Elastic Properties of Hair by Astbury in Dr. Agnes Fowth's book The Hair and Scalp is enlightening.

Each problem of hair in relation to permanent waving can be duplicated by substituting elastic ribbon for hair strands. The actual causes for failure, too large sections of hair, too small sections of hair; too much alkali, too little; too tight winding, too loose; too much time of steaming, too little, these and others were tested under experimental conditions with stop watch, thermometer and tension apparatus. Failure and success depended on technic and attention to detail. The rubber ribbon was not affected by menstruation, by pregnancy or by anesthesia. The rubber ribbon strokes were supplemented over a period of months by actual experiments of permanent waving of hair removed by hairdressers from the heads of their patrons. The results were independent of the status of the patron! The results of the experiments supported the studies of Astbury. The molecular structure of the hair explains the technic and the art of permanent waving.

Hair, wool, feather, horn, shell resemble hair as far as the molecular structure is concerned. The crepted nail resembles crepted hair in many respects. It should be possible to compare the reactions of nail and hair. Would menstruation, pregnancy and anesthesia have any effect on the crepted portion of the nail?

Herman Goodman, M.D., New York.